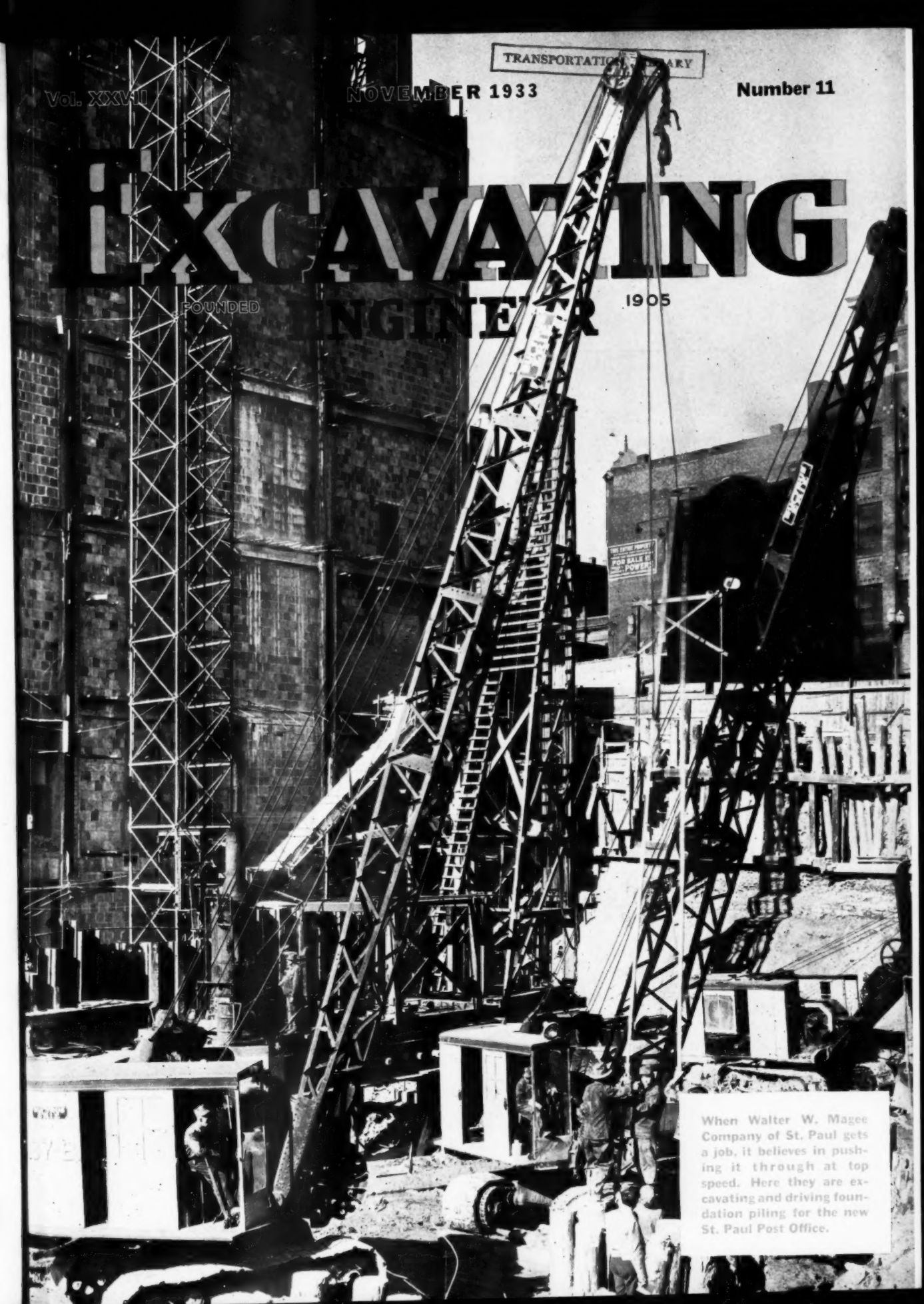
TRANSPORTATION LIBRARY

Vol. XXVII NOVEMBER 1933 Number 11

EXCAVATING ENGINEER

FOUNDED 1905

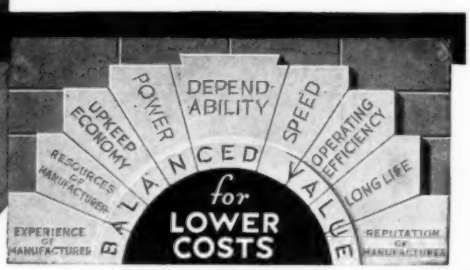


When Walter W. Magee Company of St. Paul gets a job, it believes in pushing it through at top speed. Here they are excavating and driving foundation piling for the new St. Paul Post Office.

NINE *essentials that deserve your primary consideration*

WHEN you buy an excavator, analyze each machine considered for the nine primary essentials of balanced value. Measure dependability, power, speed, long-life, operating efficiency and upkeep economy; weigh the reputation, experience and resources of the manufacturer. The machine that rates highest in all of these nine characteristics can be counted on to give you the lowest output cost and the ability to successfully bid in the jobs you want . . . and to make money on them after you get them.

When you are analyzing a machine for "*money making ability*" you are really analyzing it for *balanced value*. Analyze each machine with this in mind, and see Bucyrus-Erie before you buy!



BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

684

For your convenience in writing to Bucyrus-Erie Company, you will find a card bound in this issue.

New SAFETY »» *New* ECONOMY

NOW . . .

The socketing of wire rope becomes an easy task

FIEGE plus the Tiger—a great stride forward—and good news for users of wire rope. Fiege Tiger-Claw Wire Rope Sockets—distributed by the American Steel & Wire Company—are rightfully meeting with an enthusiastic welcome from industry.

Perfect in design—offering 100% cable strength—requiring no flame nor hot metal—attached quickly, with ordinary labor, in the field—they solve in an amazingly simple manner many bothersome and costly problems—establish new standards for safety and lower operating costs.

Fiege Tiger-Claw Wire Rope Sockets are composed of but three simple parts—a socket—a sleeve and a plug. These parts accomplish the entire task.

Take advantage of our willingness to serve you—to offer complete and detailed information covering your specific problems.

1831

1933

AMERICAN STEEL & WIRE COMPANY

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

208 South La Salle Street, Chicago — Empire State Bldg., New York
94 Grove Street, Worcester — First National Bank Bldg., Baltimore
AND ALL PRINCIPAL CITIES

Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco
Export Distributors: United States Steel Products Company, New York

Excavating Engineer

About Excavating Projects — By Excavating Men — For Excavating Men—The World Over

25 Cents Per Copy **One Dollar Per Year**
Canada or Foreign: $2.00 Per Year

Vol. 27 **NOVEMBER** **No. 11**

CONTENTS

Articles

Paint Rock, Mud and Headaches, by D. W. Evans 443
Records and Progress on Middle Rio Grande Project, by J. D. Holmes 448
Heading Off "Old Man River," by Ray Gwynn Hogan 449
Carrier's Canopy Used in Nashville Postoffice Job, by W. Burr Cullom 451
Building the Hudson River Tunnel in 1882 452
Old Times and Old Timers 453
Status National Recovery Highway Funds 454

Field Notes

Thumb Nuts Removed Without Breaking Wings 455
Use Care in Charging Sprung Bore Holes 455
Evidence of Fault in Filling Excavations 455
Accurate Leveling Kink 455

Editorial

The Business Situation 456

Equipment You Ought to Know About

Harnischfeger Develops Line of Lighting Plants 458
Gardner-Denver Announces New Wagon Drill 458
New Air-Cooled Air Compressor 458

Shots From the Firing Line

Highway Contractor's Code 459
Bidding October 25 on Three Million Yard Reclamation Project 459
Treasury Cracks at Racketeering by Certain Washington Attorneys 459
Magnitude and Importance of the Highway Industry 459
Casper-Alcova in Wyoming to Irrigate 66,000 Acres of Agricultural Land 460
Missouri River Waters to Rejuvenate Dakotas 460
Save This Map 460
Imposing Membership List in 1000 Day Safety Club 461
Highway Construction Must Continue to Go Forward, by O. W. Merrell 461
Wage Rates in Sand and Gravel Code 461
New England Notes 462
New York and Vicinity 462
Pennsylvania Notes 462
Delaware Notes 462
Virginia Notes 462
North Carolina Notes 462
Ohio Notes 464
Michigan Notes 464
Indiana Notes 464
Illinois Notes 466
Wisconsin Notes 466
South Dakota Notes 468
Missouri Notes 468
St. Louis and Vicinity 468
River Notes 468
Arkansas Notes 472
Oklahoma Notes 472
Louisiana Notes 473
Texas Notes 473
Kansas Notes 474
Colorado Notes 474
Wyoming Notes 475
Utah Notes 475
New Mexico Notes 475
Arizona Notes 475
Nevada Notes 476
San Francisco and Vicinity 476
Oregon Notes 476

Not in the Contract 477

Book Reviews 481

PUBLISHED MONTHLY BY

The Excavating Engineer Publishing Co.

SOUTH MILWAUKEE, WISCONSIN, U. S. A.

F. O. WYSE *Managing Editor* — **ARNOLD ANDREWS** *Editor* — **E. M. HEUSTON** *Advertising Manager*

Copyright 1933 by The Excavating Engineer Publishing Co.

For your convenience in writing to American Steel & Wire Company, you will find a card bound in this issue.

ROCK

...at lower costs!

One nine-inch diameter blast hole will carry the same amount of powder as two six-inch holes. Nine inch diameter blast holes can now be drilled faster and at less than the former cost of drilling six-inch diameter holes . . . the machine that makes this possible is the modern Bucyrus-Armstrong No. 29-T all-steel blast hole drill.

In most formations these larger holes with wider spacing will give satisfactory fragmentation, they speed up production fifty to one hundred percent per drill without increasing powder cost.

This means that drilling costs on *your* blast hole operations can probably be reduced at least 50 percent.

Ask about this new large-hole method for blasting rock and ore.

Blast Hole Drills

BUCYRUS-ERIE COMPANY South Milwaukee, Wis.

For your convenience in writing to Bucyrus-Erie Company, you will find a card bound in this issue.

RESULTS *not* POUNDS

THAT'S HOW TO BUY EXPLOSIVES

For greatest explosives value, use Hercules co-ordinated blasting service and buy dynamite on the basis of effective blasting results—not pounds.

When you buy from Hercules, a trained organization is ready to help you select and use the correct explosives for your work. This means improved blasting—a direct route to increased profits.

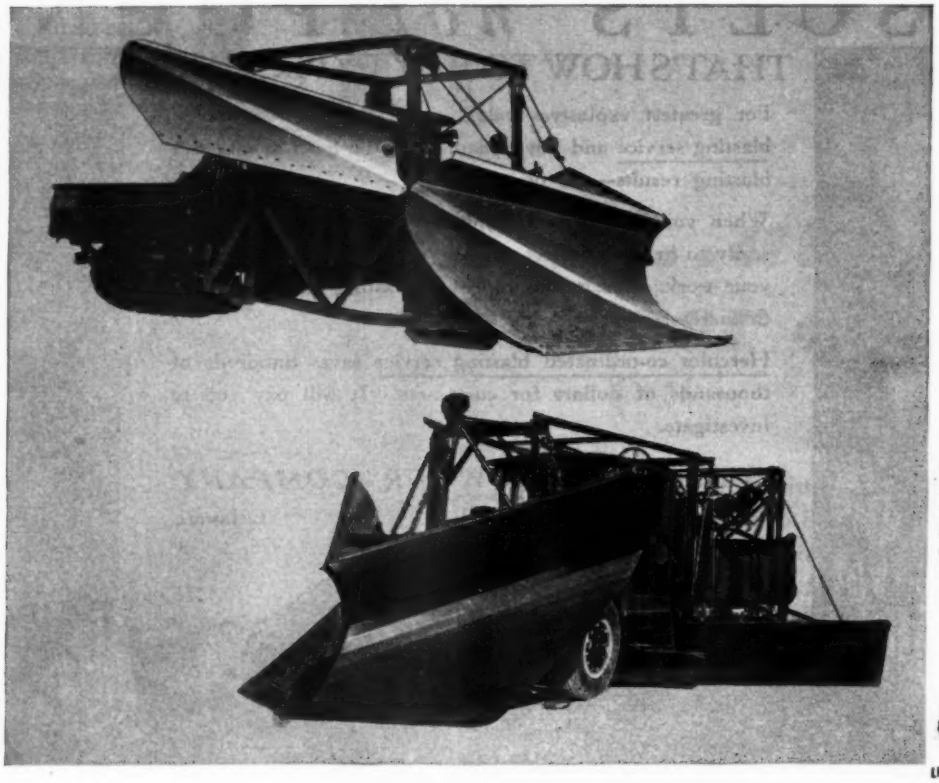
Hercules co-ordinated blasting service saves hundreds of thousands of dollars for customers. It will pay you to investigate.

HERCULES POWDER COMPANY
INCORPORATED
Wilmington Delaware

A-27

For your convenience in writing to Hercules Powder Co., you will find a card bound in this issue.

The LINN-Sargent hydraulically operated Hi-wing snowplow, designed especially for use with the LINN.



The LINN-Frink manually operated snowplow, designed especially for use with the LINN.

LINN TRACTORS

LINN PRODUCTS ARE PATENTED

LINN *Snow-fighting* EQUIPMENT

LINN'S patented flexible traction and specially designed ice-creepers always obtain sure-footed traction in ice or snow. And the massive power of the LINN enables it to clear the entire width of the road on one trip. *LINN has no equal in moving deep, tightly packed snow from the roads . . .* For economically fighting snow with the LINN, either the LINN-Sargent hydraulically operated plow or the LINN-Frink manually operated plow is recommended. Both have successfully met all tests under severest conditions and are being widely used by counties and townships in the snow belt . . . If you are interested in equipment which will move snow, ice and heaviest drifts—keep roads open at high speed and at lowest costs — send for bulletins on LINN snow fighting equipment. Or, call the nearest LINN office.

NRA

THE LINN MANUFACTURING CORPORATION

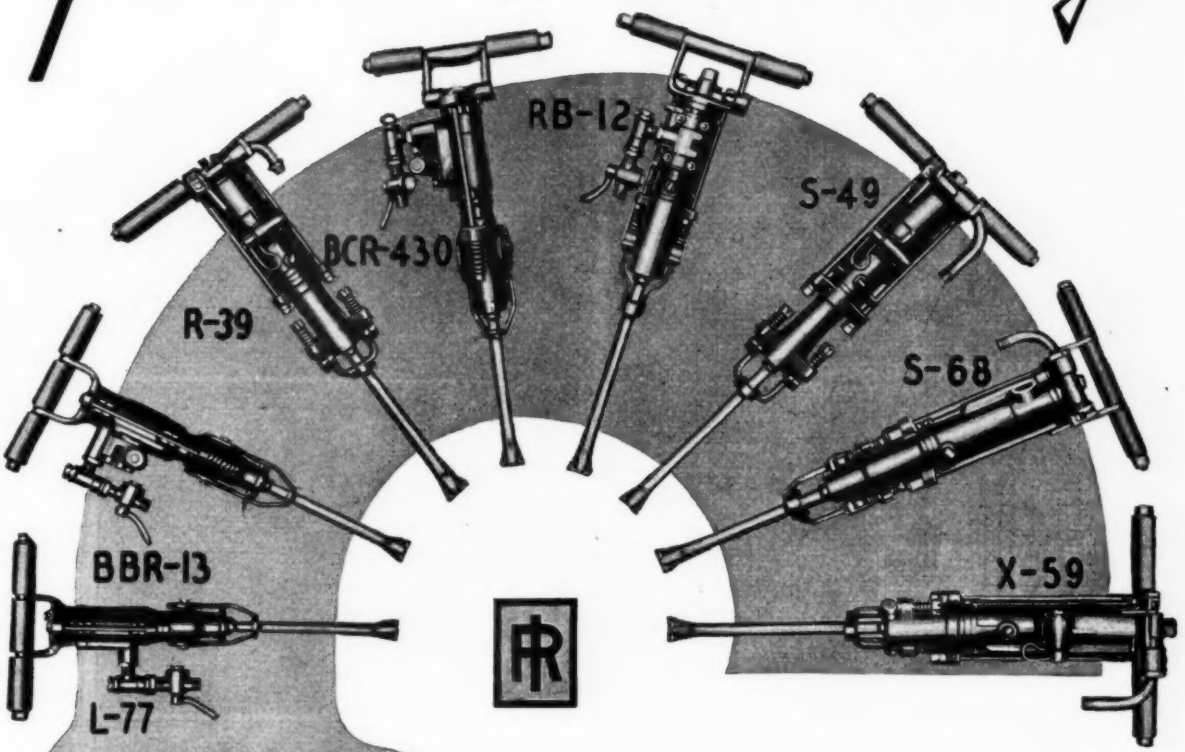
MORRIS, NEW YORK

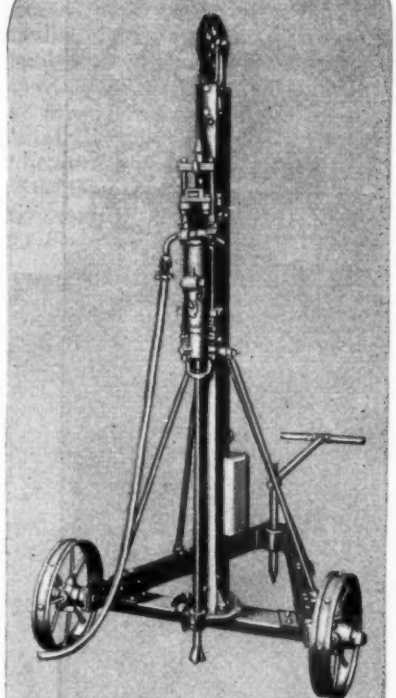
Represented in Allentown, Pa. · Baltimore, Md. · Chicago, Ill. · Denver, Col. · Los Angeles, Cal. · Louisville, Ky. · Nashville, Tenn. · New Haven, Conn. · New York, N. Y. · Omaha, Nebr. · Pittsburgh, Pa. · Portland, Ore. · Roanoke, Virginia · St. Paul, Minn. · Salt Lake City, Utah · Sioux Falls, S. D. · Skowhegan, Maine · Spokane, Wash. · Youngstown, Ohio

Canadian Linn Distributors: Mussens Limited, Montreal

For your convenience in writing to Linn Manufacturing Corporation, you will find a card bound in this issue.

The "Jackhamer" Family





The Wagon-Mounted "Jackhamer"

There is a "Jackhamer" Drill for any job, from horizontal drilling to straight down-hole work, in any kind of rock. Eight sizes, ranging in weight from 26 to 75 pounds, allow the selection of one drill that will meet any set of conditions exactly.

The 26-pound drill is light enough for horizontal drilling, while the largest and heaviest "Jackhamer" is for deep down holes in the hardest kind of rock. Intermediate sizes completely bridge the gap.

Among this family of "Jackhamers" are drills of the dry, wet, blower, and auger types; machines with a heavy piston blow for hard rock, and others with powerful rotation and great hole-cleaning capacity for soft rock.

"Jackhamers" may be wagon-mounted and equipped with automatic feed. Such a machine will drill at any angle from vertical to horizontal. Under suitable conditions it will do the work of two hand-held drills.

INGERSOLL-RAND CO., 11 Broadway, New York City

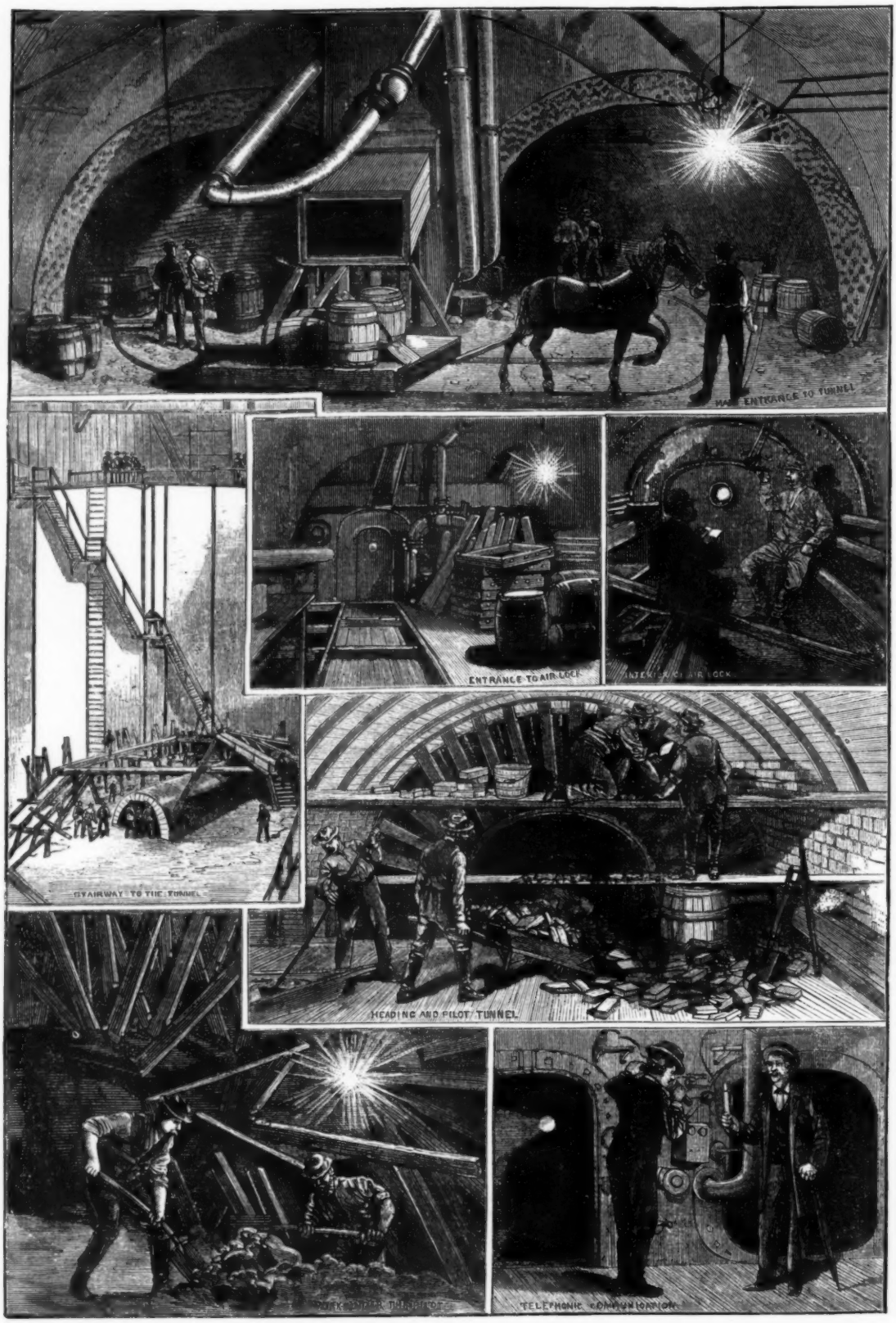
Branches or distributors in principal cities the world over

For Canada Refer—Canadian Ingersoll-Rand Co., Limited
620 Cathcart Street, Montreal, Quebec

365JD

Ingersoll-Rand

For your convenience in writing to Ingersoll-Rand Co., you will find a card bound in this issue.



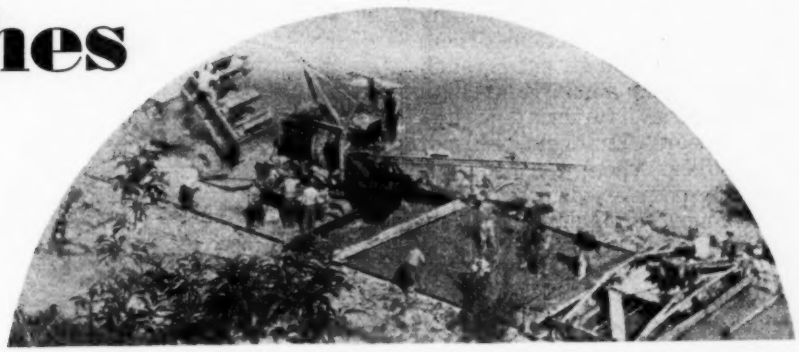
Tunnel Driving Methods in 1882

on the Hudson River Tunnel between Jersey City and New York as presented in Frank Leslie's Illustrated Newspaper, January 21, 1882, from sketches by a staff artist. *See page 452 for a complete description.*

EXCAVATING ENGINEER
FOUNDED 1905

NOVEMBER, 1933
VOL. XXVII NO. 11

Paint Rock, Mud and Headaches



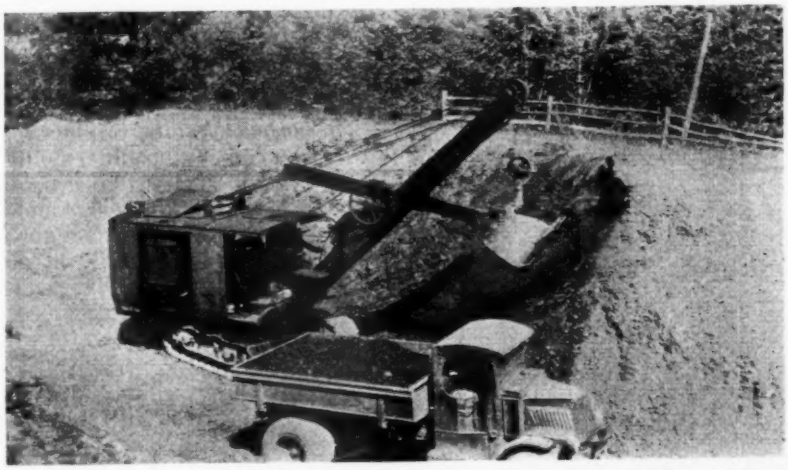
View of paving operations. ¼-yard Mack truck with body divided into three compartments, and with three steel hatch boxes for concrete, drops a batch into skip of 27-E Multifoote paver operated by Charlie Scott. In right foreground, Lakewood finishing machine. Above can be seen Maiden Creek, now a peaceful stream.

By D. W. EVANS

H. R. Miller Company completes Pennsylvania winter grading job on schedule, in spite of snow, rain and floods.

TRAVELERS in the northeastern part of Berks County, Pennsylvania who found it necessary to go between Lenhartsville and Kempton, have probably cussed plenty at the narrow, winding, hilly gravel road that meanders up over Blue Mountain. Such travelers will now be agreeably surprised at the fine 18-foot concrete highway recently completed by the H. R. Miller Co., of Lancaster, Pa., between those two points. In its twists and turns the old road followed and crossed a gentle (?) stream called Maiden Creek. Two channel changes in this creek, and a good many thousand yards of rock excavation were required for the high speed grade which now carries the new slab of concrete entirely on the West side of the stream.

The H. R. Miller Company has been doing highway work in Pennsylvania for some 8 or 10 years. The smooth way their jobs run indicates that they know plenty about building roads. The Company is composed of H. R. Miller and John Brenner. Stanley Brenner, the Superintendent on the job which forms the subject of this article, is Jack's brother, and was formerly a Pennsylvania State Highway Engineer. In addition to this job the H. R. Miller Company at present has jobs under way, at Fredericksburg and at Summit Station.



This 6-year old Miller Gas + Air with Richard Kane up scrapes a few loads of dirt off the slope of a cut. The dirt goes to build up the fills on channel changes to prevent future flooding of new highway. Loading into ¼-yard Mack truck.

Specifications called for 151,000 yards of unclassified excavation, at a price of 55 cents a yard, in a total length of 4.59 miles. Miller sublet 4000 feet, the northern end of the job to Peffer & Viall of Mount Holly Springs. This section contained 42,000 yards of excavation, mostly in one big box cut 40 ft. deep through shale rock at the top of Blue Mountain. These contractors had a bit of luck in the natural drainage of this section, as they did not have the delays due

to wet weather which were encountered on the part of the road done by the H. R. Miller Company.

60,000 yards in two cuts

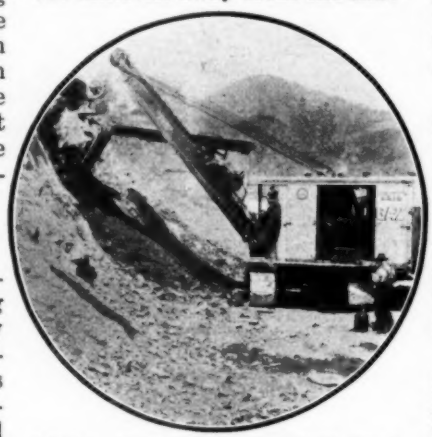
The balance of the job consisted of about 40,000 yards of relatively small alternate cuts and fills for the southern three miles, and heavy excavation of 60,000 odd yards in two rock cuts at the north and immediately adjoining Peffer & Viall's section. There was first the 600 ft. cut through "paint rock" to a maximum depth of 60 feet and further down the hill a mean 300 ft. side hill cut also in rock. There was also some 6000 yards involved in two channel changes in Maiden Creek.

Use Well-drills On Rock

While these two rock cuts comprised by far the hardest digging on the job, drilling was necessary on all sections. Most of the drilling was done with two well drills rented from Elias Gassert of Palmyra. They also did a small amount of jackhammer work, using two Ingersoll-Rand compressors. The well drills are built by Gassert, mounted on a Sterling truck. A shorter tower than that on regular well drills is used, and power for drilling is supplied by a Studebaker engine. 6″ bits furnished by the Gill Rock Drill Company of Lebanon, Pa., are used for actually putting down the holes, using Manila "cracker" for springing the drills. On blasting 40 per cent dynamite was used almost entirely, although some 30 per cent was used in experimenting on the difficult "paint rock" shale.

1-yard largest practical shovel size.

On the grading, the H. R. Miller Company considers that a 1-yard shovel is the maximum size practical for Pennsylvania highway work. "We find the real problem on excavation is to get the material away from the shovels," Stanley Brenner tells us. "The 4-yard trucks we use for hauling cannot get the dirt away fast enough from a larger shovel to keep it busy, and we find these Gas-plus-Airs have plenty of guts to handle rock digging."



Charlie Andrews' factory-rebuilt Gas+Air working in a borrow pit. This 1-yard shovel moved 43,000 yards in 47 ten hour shifts. Mr. Andrews (on running board) ran part of the time, and Stanley Schaeffer (at levers) handled the machine mostly.

They used three 1-yard Bucyrus-Erie Gas+Air shovels on excavation, two of them being six year old veterans owned by the Miller Company. The third Gas+Air was a factory rebuilt machine owned and often operated by Charles Andrews of Philadelphia. Mr. Andrews had a sub-contract from Miller on a yardage basis, his shovel being worked along with Miller's wherever required. Both Mr. Andrews and Mr. Brenner were enthusiastic over the performance of this machine, which was as smooth running and free from breakdowns as a new one.

Mack and White trucks with 4-yard struck measure bodies were used for hauling, 3 and sometimes 4 trucks being used under each shovel, depending on the length of haul. While the average for the job as a whole was 1300 feet, the bulk of the excavation in the big cut had to be moved only about 400 feet.

At the north end of the job, Peffer & Viall had a ⅞ yd. Lorain 55 shovel, using 4-yard Mack trucks for hauling.

The Lenhartsville job is an Emergency Project designed to alleviate unemployment. Under the specifications, fill material other than rock is spread by hand labor—a provision designed to increase employment. But there was so much rock to be spread in the fills that 5 Caterpillar 30 tractors with La Plant-Choate bulldozers were used on the fills, and for compacting in layers they had a 10-ton Buffalo-Springfield roller.

Left: This is the 43,000 yard cut through paint rock when three lifts had been taken off. Approximately half finished. Center: The big cut finished down to rough grade. Norman Ziemerman, foreman, gets credit for the beautiful slopes through this cut. Right: This mean side hill cut was just below the "paint rock" cut. Note the mud in foreground which caused many a headache. Hauling through this was terrible!

Left to right, standing: Stanley Brenner, Supt.; Arthur Fellenbaum, foreman for Andrews; Charlie Andrews, owner of GA-2 in background. At levers: Stanley Schaeffer. The Swastika on the side of this Gas+Air is used on all Miller's equipment as a means of identification. Stanley Brenner claims Adolf Hitler is infringing the Miller trademark.

Delayed by Wet Weather

For the past five years these contractors have been very successful in winter grading, and in line with this record started digging on Blue Mountain on January 5. One Gas+Air started in Lenhartsville and worked north. The other two started in the two big cuts on the slope of the mountain. Due to the unfortunate lay of the land, many days were lost because of wet weather. There was so much delay that it became necessary to double shift the grading, and to bring in two additional shovels. Peffer & Viall imported a ⅞-yard Koehring 301 belonging to B. H. Snyder of Carlisle, and this shovel was worked at a point about a mile from the southern, or Lenhartsville, end of the job. Mr. Miller shipped in a Lorain 75 owned by Warren Hartman of Mountville. With this additional equipment they began to catch up on the progress schedule in spite of continued wet weather.

Two Channel Changes Show Comparative Methods

Part of the grading completed during this time were the two channel changes in Maiden Creek. Mr. Miller cleaned up one of these with a Gas+Air, and the other was done by B. H. Snyder's Koehring. The different methods used on the two pieces of work afford an interesting comparison. In each case 3000 yards had to be moved from the east bank of Maiden Creek about 45 feet to a fill on the west side. Mr. Snyder started using a clamshell which he figured would enable him to place the dirt without hauling or rehandling. But it was difficult to excavate on the bank of the creek with the long boom necessary to give the required reach. This method proved slow, so truck hauling was started, still loading with the clamshell. Progress was still slow, and in the meantime the excessive rainfall caused gentle (?) Maiden Creek to swell to a furious torrent, so the work had to be postponed until flood conditions subsided. The channel change was finally completed, using a shovel to load trucks for the short haul across the creek.

This old timer dug paint rock until the plant burned down ten years ago. The new highway is just beyond the top of this hill.

On the Miller channel change a totally different method was used, which proved far more successful, and much quicker. The Gas+Air shovel was run right into the creek, and mucked out the dirt from the east bank quickly, casting it nearly in the middle of the stream, which at that time had not started to rise. When the required yardage was cut from the bank, the shovel picked up the pile in the creek, and dumped

The Blaw-Knox bulk cement plant. Note total absence of any sign of cement dust. The cement is in totally enclosed containers and conveyors from time it leaves the tank car at right until it is loaded into the skip of the paver.

Below: Operator Joe Bell on Peffer & Viall's Lorain 55 loads a 4-yard Mack truck. The north end of the job is behind trees at right center.

One of the H. R. Miller veteran Gas+Airs, operated by C. L. "Roy" Miller, loading stone into the Butler bin.

it near the west bank. A third rehandling deposited the dirt at its final destination, and the whole thing was in place in 10 days.

Foreman Shoots Shale Rock Successfully

Meanwhile two of the Gas+Airs were bucking rock at the north end of the Miller section. Shale rock is always a tough proposition to shoot, and this "paint rock", in spite of its other uses, is no exception. This particular rock lay in strata more nearly vertical than horizontal, which made it all the harder. Norman Ziemerman was grade foreman, and to him goes the credit for the excellent results obtained in putting through these two big rock cuts. He did some experimenting at the start with the drilling and shooting, trying different spacing and depth of holes and different loading. The best shattering was produced by shooting only two holes at a time. These were 8 to 14 feet deep depending on the position in the cut, and spaced on 14 foot centers. This method was used for most of the big rock cut.

Not only did Mr. Ziemerman succeed in so breaking up the shale that good daily yardages were produced by the Gas+Air shovels, but the slopes on the finished cut are remarkably uniform. Every contractor who has had the job knows how hard it is to shoot the sides of a rock cut back to the grade line without getting overbreak which spoils the slope. The contract called for ½ to 1 slopes in the rock, and 1 to 1 above through the dirt. As the illustrations show, they got those slopes as acccurately as though they were cut by hand through dirt.

Paint Rock and Its Manufacture

Many readers will probably be familiar with this "paint rock", but it is something new to this writer. In appearance it looks like any other hard shale, except that layers of brilliant colors are found, ranging from brown through bronze to red, yellow, green and copper blue. Through this section of Pennsylvania "paint rock" products have been manufactured for generations. The rock has two principal commercial uses: It is granulated and then applied to composition roofing shingles; or it is pulverized and used as a base for paint. It is mostly manufactured in red and green. Variations in shade are accomplished by mixing the ground product with chalk or soft coal.

Down below the box cut put through by the Gas+Air shovels lie the ruins of a paint rock plant which burned down about ten years ago. Standing in a nearby quarry is an ancient "horizontal crowd" Thew steam shovel, one of those first revolving shovels invented by Captain Thew for loading railroad cars on the ore docks at Cleveland, the kind of shovel that had a dipper that would turn around and look at you. A native informs us that years ago the farmers hereabouts got $5.00 a wagonload for quarrying paint rock and delivering it at the plant. This shovel replaced the

View of 50-foot fill placed by Peffer & Viall at south end of their work. Caterpillar 30 tractor with bulldozer in foreground.

A slant at the Peffer & Viall fill, looking south. Behind the trucks can be seen the "paint rock" cut. The lower view shows a panorama from top of Blue Mountain. In foreground, edge of "paint rock" cut. In center right is Maiden Creek.

farmers, as it could load rock into the plant for less than half as much. But in all the years it worked it loaded out less than 10,000 yards of rock. The modern Bucyrus-Erie Gas+Air shovel bucked through 43,000 yards of the same rock in just 47 working days. And the contractor got about one-tenth as much per yard as the farmers used to get.

Flood Further Delays Job

In spite of continued bad weather, which delayed the grading even when work was possible, after five weeks on double shift the job was again on schedule, and from that time was worked on a single ten-hour shift basis. During two weeks of this time Maiden Creek was in flood, which was an additional handicap because it prevented the trucks from using two or three fords. Once on a night shift the driver of one of the White trucks tried to cross the swollen creek, and got stuck with water up to the floor of the cab. Everybody was so busy they just left him there for the night, and next night somebody suggested if he planned to cross the creek he'd better use a rowboat. Snyder's Koehring almost got stuck for two weeks in the creek, too. The water was over the crawlers, and rising, when they noticed it. The shovel ran out onto the bank without difficulty, and worked on higher ground for a couple of weeks until the water dropped enough so that the channel change could be finished.

Raise Fill Because of Flood

Owing to the new high record flood of Maiden Creek, it was decided to raise the fill along the two channel changes an additional 3 feet, which increased the total yardage from 151,000 to 165,000 yards. Some of this extra dirt was obtained by widening out some of the cuts on the job, and the balance from borrow pits alongside the old road.

Gas-Air Gets Record Yardage

Five months after the start of the job, grading was virtually completed. Charlie Andrews' Bucyrus-Erie Gas+Air shovel, operated by Stanley Schaeffer, and sometimes by Mr. Andrews himself, hung up the best yardage record, moving 43,000 yards. Due to the bad weather, the shovel actually worked only 47 shifts. In the same working time, the Miller Gas+Airs moved about 26,000 yards apiece, and the Snyder Koehring handled 22,000 yards. The Lorain 75, which was only on the job for a month moved 7,000 yards. At the north end of the job, Peffer & Viall managed to get 60 shifts in during the first five months, and operator Joe Bell dug 38,000 yards on their section with the Lorain 55.

Bulk Cement Plant a New Convenience

On April 26 concreting was started at Lenhartsville. The batching plant had been set up midway of the job, and a few days before Operator C. L. "Roy" Miller moved one of the Miller Gas+Airs down to the plant and put on a clamshell bucket and boom. With this machine he has kept a Butler weighing bin filled with sand and stone. With this bin and a Blaw-Knox bulk cement plant, real accuracy is possible in weighing out ingredients for the concrete. The Blaw-Knox plant is the last word in convenience. It is set up along the railroad siding without expense to the contractor, and the cement is delivered on the job in a tank car with special conveying equipment inside the car for discharging the cement through a central hopper. From this point the cement is transported through an enclosed screw conveyor to the storage bin at the top of the plant, from which the cement is discharged by gravity into an enclosed weighing bin. After weighing it drops into a hopper from which it is dumped into a covered steel box on the truck. There are none of those clouds of cement dust familiar to everyone who has watched cement batching on a highway job.

In converting the 4-yard bodies of the Mack trucks for batch haul, two partitions which can be swung back like the tail gate are fastened in, dividing the body into compartments for three batches of sand and stone. At the forward end of each compartment, and mounted just above

(Continued on Page 480)

Records and Progress on Middle Rio Grande Project

June Output Sets Record of 1,085,000 Cubic Yards

By J. D. Holmes

THE EXCAVATION of earth on the Middle Rio Grande Conservancy District's project reached a high peak during the month of June when 1,085,000 cubic yards were moved. This is the highest record made in any one month since the project started in March, 1929, according to records in the office of Chief Engineer C. H. Howell. It is also believed this is a record, unexcelled on any project, for this type of excavation.

The excavation was on drain ditches varying from ten-foot cuts in ten-foot bottom to one and one-half foot cuts in six-foot bottom canals.

Six Bucyrus-Erie 50 B's with one and one-half yard buckets and ten P & H Class 750, with one and one-quarter yard buckets were used.

Two Bucyrus-Erie draglines made the best individual records. Machine No. 125 moved 132,730 cubic yards. The operators on this machine were Joe Victor, O. O. Miller and George Hart. Machine No. 127 with operators W. W. Snyder, J. B. Kelly and Ed Odle excavated 115,000 cubic yards.

Machine No. 123, also a Bucyrus-Erie, excavated 23,000 lineal feet of eight foot bottom irrigation canal. Operators were Bob Lytle, O. M. Brown and George Wolf.

July excavation totaled 784,461 and August 940,000 cubic yards. High production and low cost of excavation has been consistently maintained on this job through the efforts of A. B. "Steve" Gale, mechanical superintendent.

Of the 18,000,000 cubic yards excavated to date, Bucyrus-Erie excavators have excavated 7,890,003 cubic yards at a cost of 04.78 cents per yard. This is, indeed, a low cost especially when you take into consideration that the machines have been in service a little over four years. Repairs, supplies, handling materials and depreciation are all charged against excavation costs.

Repair bills have been low as indicated by the record. Although the machines are put to hard use and have been employed some of the time in pile driving, only minor repairs and an occasionally overhauling have been necessary to date.

Work on the project in every department is going forward at a rapid rate. Construction has been started on El Vado storage dam, Angostura, Isleta and San Acasia diversion dams. These are the major structures of the project.

Cochiti diversion dam, Atrisco and San Juan river headings have been completed.

The El Vado dam is estimated to cost $1,600,000 and will store 200,000 acre feet when completed. It is a gravel fill structure and the upstream side will be faced with ¼" steel plates electric welded. The dam will be 1200 feet long at the crest, 180 feet high, 600 feet thick at the base and 20 feet at the crest. It is located on the Chama River, a tributary to the Rio Grande, and is 180 miles north of Albuquerque.

A tunnel, 12 feet in diameter, 800 feet long, is being bored through the mountain parallel with the river to divert the water while the dam is under construction and to be used later as an outlet for irrigation water.

A concrete cut-off wall 1500 feet in length, extending down to bed-rock, is being constructed on the upstream side of the dam. The steel plates will be anchored to this with provisions made for expansion.

Major quantities for El Vado

1400 tons of ¼" steel plate
510,000 cubic yards gravel fill for main body of dam
3,000 cubic yards of concrete
30,000 pounds of explosives
3500 cubic yards hard rock excavation and 1500 soft rock for tunnel
8,000 barrels of cement

A camp consisting of four bunk houses accommodating 24 men each; two office worker's and foremen's bunk houses accommodating 16 men each; a four-room office building; mess hall and kitchen; commissary and warehouse have been constructed.

Diversion Weirs

The Angostura weir in the Albuquerque division will be of reinforced concrete set on two rows of Carnegie steel piling. It is 600 feet long and rises about five feet above the river bed. Three radial gates 3'x20' will be installed on the east end to divert the water into the Albuquerque Canal. Concrete for this structure will total 4,500 cubic yards, excavation 100,000 cubic yards and reinforcing steel 280,000 pounds. The estimated cost is $170,000.

The Isleta weir in the Belen division will also be of reinforced concrete set on two rows of Carnegie piling, however, there will be 30, 5'x20' radial gates extending across the river on this weir. These gates are placed so that flood waters may be quickly discharged.

There will be 300,000 pounds of reinforcing steel; 890,000 pounds of Carnegie piling and 5,000 barrels of cement used on the Isleta structure.

The quantities and type of the San Acasia weir in the Socorro division are practically the same as that of the Angostura weir.

The river protection and drainage work of the district is practically finished. Construction work now is being concentrated on major structures and the irrigation system.

An air view of the completed river heading.

Heading Off "Old Man River"

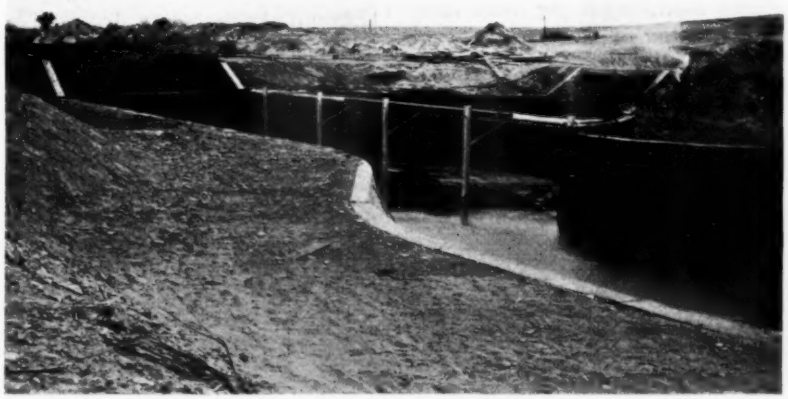
By

RAY GWYNN HOGAN

THE FIRST of the four large river headings being constructed by the Middle Rio Grand Conservancy District in the Rio Grande valley was completed during the early part of June at a point just three miles west of Albuquerque. This is the first major product of the enormous reclamation project which is now in full swing in the valley.

Thirty thousand acres of farmlands which heretofore have been dependent upon the whims of the Rio Grande river for irrigation now have all the water they can use and are privileged to draw more from the huge Arenal canal which carries the flow from the main canal to numerous takeouts down the valley, if it becomes necessary.

As unique as practical, this heading solves one of the largest problems that farmers in a land where rain is not common, are faced with.



The heart of the heading. The gate on the right permits water to flow into irrigation ditches. The left returns the surplus to the river.

Troubles!

But—all was not a bed of roses in constructing this boon to the agricultural men and a great amount of particular work was required of the dragline that handled the excavating and earth moving.

A natural bend in the river prompted the placing of the heading in this particular spot along the water but in order to utilize this advantage a large amount of excavating had to be done along a high bank of cliffs that bordered the river on the western side. These cliffs are of sand and while the excavating was being done they continued to sluff off in large sections and cover the work that had been completed below. As a result the machine was sent back to the top of the bluffs and the tops pulled off thus removing a great amount of weight and overcoming this obstacle.

And more trouble!

Work was then begun on the main canal that carried water to the gates but as it was entirely through sand, the same trouble

was encountered and it was only solved by concreting the ditch for its full length of eight hundred feet. The ditch carries a sixteen foot bottom and a two to one slope. At the point where the river meets the ditch a dam of ten inch re-inforced concrete was built to keep the river from cutting into the sand and getting in behind the main canal. The dam itself had to be protected by rip-rap paving to prevent its being undermined.

A footbridge was constructed at a point running from the lower end of the dam to the opposite

Bucyrus-Erie 50-B Diesel draglines have established many an enviable performance record on Middle Rio Grande Conservancy District projects. This one is shown building levee.

side of the main canal where it joined with the river channel or sluiceway and flood gate frames were anchored below the water. Ten of the gates will control the supply of water entering the main canal, the balance being shunted into the sluiceway and carried back to the river through the channel at a point below the heading.

Rails for sheet piling

A very effective and economical manner of protecting the sluiceway from cutting away was used by engineers handling the job.

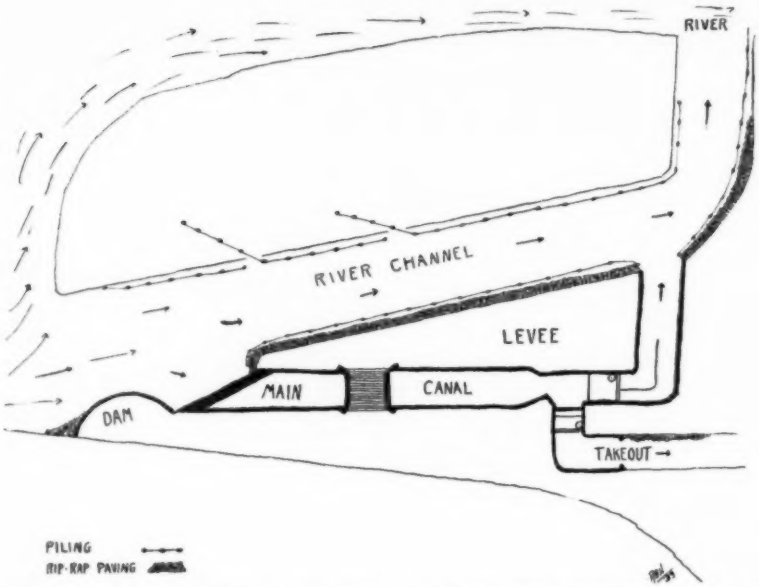


Diagram showing the first of four river headings being constructed. This one furnishes water for the irrigation of 30,000 acres.

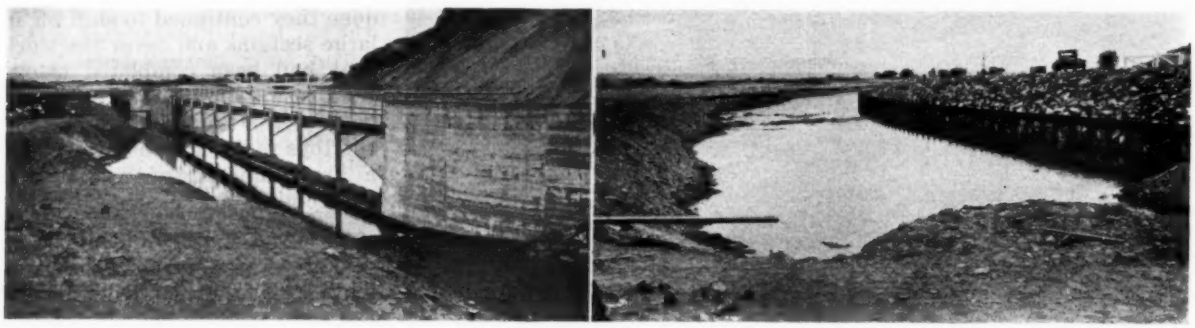
Suspending leads from the boom of the dragline, steel railroad rails that were purchased at low cost from a defunct railway were driven into the ground in such a manner that the base or flat side of the rails were left facing the water. Quarter inch cable was strung through the holes of the rails and to this cable was bound heavy wire fencing, the idea in mind being that all drift would catch in and against the wire and form a strong dike. On the side where the water ran against the levee, volcanic rock was hauled and the entire strip was rip-rapped to a height of seven feet and a depth of three thus giving a maximum in flood protection.

All ditches were sloped to precision and a level was carried throughout, requiring very careful handling of the bucket by all three operators on the Bucyrus-Erie which ran twenty-four hours of the day. No major repairs were necessary during the course of the job and no accident of any consequence occurred although the time required to complete the project exceeded six months. J. I. Reed, Wm. McElean and W. S. Gray deserve credit for this excellent record.

Gates made in builder's shops

The lower gates installed by the machine were constructed in the machine shops of the Conservancy District and were made of channel iron and corrugated sheet iron. The larger gate weighing around three thousand pounds and the smaller a trifle less, were connected to the walls by four inch shafts and are raised and lowered by hand lifts running through strong worm drives. The larger lift has a capacity of eight

(Continued on Page 457)



Left: The dam and flood gate frames ready for flash boards. Right: Method employed in protecting banks of river channel.

Carrier's Canopy used in Nashville Postoffice Job

An Ingenious Shop-Made "Canopy" Saves Time and Prevents Damage

By W. BURR CULLOM

Superintendent William M. Carrier.

SO FAR as is known, the protective device known as "Carrier's Canopy" which was designed and first used by W. M. Carrier, Superintendent of the Carrier Wrecking and Excavating Company of Flint, Michigan, was used for the first time in the South in the blasting operations at the post office job now under way in Nashville, Tennessee. The work of excavating, which covered the greater part of a city square, called for the removal of 12,000 yards of limestone and 13,000 yards of dirt. In spite of the fact that the site was once occupied by stores with basements, a great deal of blasting was necessary.

Without the protection afforded by the canopy and the speed with which shots could be made, the work would have been slowed down considerably. The canopy is a large box, with a closed top but no bottom. In use it is placed over the holes to be shot. As the box is not air-tight, and since it usually rests on rough ground, there is ample air ventage. At the time of the explosion, the heavy canopy catches the flying rocks and the sudden compression of air. By means of the air vents the compression is released more or less gradually. The air space in the canopy provides a pocket that cushions the explosion very much like the cylinder in the familiar door-check cushions the rebound of the door. The device muffles the sound, reduces vibration and prevents damage from flying rocks.

Two of Superintendent Carrier's helpers —Gordon A. Ellis, Excavating Engineer (left), and Ed Jones, Truck Foreman (right).

Mr. Carrier used his invention for the first time in the blasting operations at the Springfield, Ohio post office. It was made on the job with heavy, oak timbers 6″x6″x16′, forming a box 16′x16′ x2″. The timbers were nailed and bolted securely together, and the top was double floored, while the whole was strengthened with angle-irons. To provide convenient means of handling, cables were fastened to diagonal corners, and where these cables met in the middle over the top, they were fastened to a chain-loop. When the charge is ready to be fired, Archie Hamby, operator of Old Jupiter, one of the Bucyrus-Erie one-yard steam shovels, moves over and hooks its dipper teeth in the chain-loop and swings it in place over the holes to be shot. The whole operation takes about three minutes, often less.

Smaller canopy used for ledge shots

In making ledge shots, Mr. Carrier also uses an oaken mat of somewhat smaller size to stand up against the bank. Then with the canopy over the holes the shot is made. With both mat and canopy in place, twenty-five or thirty sticks of dynamite are often shot at one time without disengaging the dipper teeth or moving the shovel. At the time of explosion the operator simply

(Continued on Page 457)

When a shot is ready to be fired, Archie Hamby, operator, "marches" his one yard steamer over with the canopy hooked over the dipper teeth and places it so as to catch any flying rocks following the blast. The whole operation takes but a few minutes.

Building the Hudson River Tunnel in 1882

(See frontispiece page 442)

TUNNEL EXCAVATION nowadays is a considerably different operation from that shown in the frontispiece illustration reproduced from Frank Leslie's Illustrated Newspaper, January 21, 1882.

Leslie's describes the operation of fifty-one years ago as follows:

THE HUDSON RIVER TUNNEL

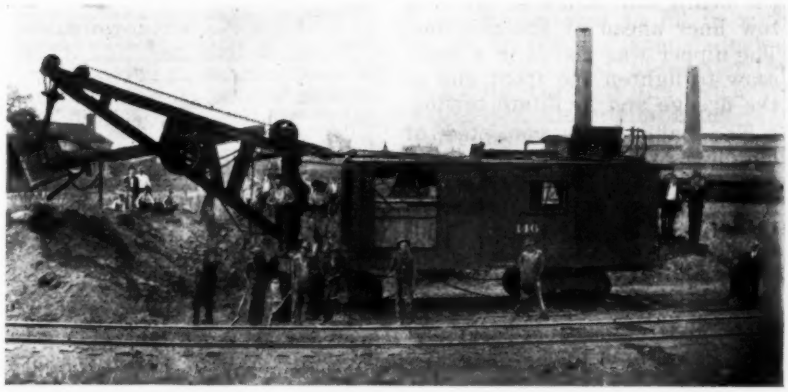
This great enterprise, which was arrested for a time by the terrible accident in July, 1880, is again vigorously under way from the New Jersey side. During the past year many improvements have been made in the methods of doing the work in the twin tunnels. Already a distance of 650 feet from the New Jersey shore has been penetrated, and the process of sinking a caisson at Morton Street, on the New York side, from which to tunnel towards Jersey City, is approaching completion. Practical engineers who have recently given the enterprise a close examination are satisfied that it has passed the experimental point, and is as certain of a successful conclusion as the East River Bridge or any one of the great engineering works now in progress in England and on the Continent. With the completion of the Morton Street caisson, the opening of the twin tunnels will be commenced and carried on night and day, Sundays and holidays, just as is done now on the New Jersey side. General Smith, the engineer, hopes to have the tunneling from the caisson well under way by next Spring, not only towards New Jersey, but also towards Broadway, near which the tunnel will terminate.

Our illustration presents a graphic picture of the scenes and method of operations employed in the tunnels. At a distance of 400 feet from the caisson in each tunnel has been built an air-tight and water bulkhead, the walls of which are of masonry three feet in thickness, backed by a foot of solid timber, the whole braced with heavy timbers let into the brickwork of the tunnel. Each bulkhead is provided with two air-locks, one of which is kept open continually towards the workmen, so as in case of an accident it may afford them a place of refuge and immediate access to the outer world. The compressed air used in the constantly lengthening chamber comes down from the engines at the surface of the ground through a large iron pipe which divides in the caisson, one end terminating in the south, the other in the north, tunnel. The air-pressure is twenty-three pounds to the square inch, and although such a pressure is regarded as terrific by a visitor, by the workmen who have grown accustomed to it no disagreeable effects are experienced. Besides the bulkheads, another important improvement has been introduced in connection with the work of excavation. Formerly the work of excavation was done by puddling the silt (mud) with water into a semi-fluid state and then forcing it out with air-pressure. This method, now in common use both in this country and in Europe, was invented by General Smith in 1859, and was by him patented. The process is now aided by the addition of a powerful current of water forced through the discharge-pipe, for which purpose Captain Eads' sand pump is used. The discharge-pipe empties its contents into a tank on the land, from which it flows in troughs to the dumping-grounds, away back on the New Jersey flats. On reaching the dumping-ground it spreads out into settling basins, from which the clear water is permitted to flow back into the river whence it came after the silt has been completely dropped. The silt is thus carried out of the tunnel without the necessity of rehandling, an item of expense which alone formerly cost $50 a day. To puddle the silt a large box is placed at the heading (the end of the tunnel where excavation is in progress), surmounted by a smaller one with a wire screen bottom. The silt is thrown into the smaller box, where it is cut up by a powerful jet of water. It then flows into the larger box, where it is taken up by the suction from the Eads pump, aided by the compressed air. Passing through the pump, it acquires the impetus of the current of water, which is running through the pump with the pressure of about 100 pounds to the square inch, and with this and the air-pressure of about twenty-three pounds to the square inch it is carried forward through 450 feet of pipe and up through a height of seventy-two feet, where it is discharged into the tank. A third improvement in the methods of construction is the substitution of concrete for brick for lining the bottom and lower half of the tunnels. Concrete is claimed to possess more strength than brick and to be superior to it in work of this nature. By means of a telephone the engineer in his office on the land is in constant communication with the workmen, and can be instantly informed of any unusual happenings or any threatening signs of danger.

The workmen employed at the headings are divided into three gangs of about ten men each, that being as large a number as can conveniently operate in a space of eighteen by sixteen feet, those being the vertical and horizontal diameters respectively of the tunnel. They work eight hours each and then are relieved, a new gang coming on at 8 A. M. and 4 and 12 P. M. daily. The men are allowed half an hour for a lunch, and generally come through the air-lock and into the outer chamber, where it is much cooler, to eat their meal. At the conclusion of their labors they go to a room especially provided for their accommodation, where they dry their clothes and are furnished with coffee.

Old Times & Old Timers

Edgar Jobe Fired This Old Timer



OLD TIMER Edgar Jobe of Reelsville, Indiana, sends us this picture of one of the early machines built by the Bucyrus-Erie organization. Number 146 was shipped to the Terra Haute & Indianapolis Railroad, Indianapolis, on June 29th, 1892. It was known as a "Standard No. 1 Steamshovel with high crane." Says the Bucyrus Steam Shovel and Dredge Company catalog of that time:

"This is the usual size of steam shovel for general and heavy work. . . . Its capacity varies according to location, character of material and means of taking it away. The speed of working is from 4 to 5 dippers per minute, which is equal to a theoretical rate of 420 to 525 cubic yards per hour. From this rate proper allowance must be made for shifting cars, moving up, imperfect filling, etc. This size of shovel has loaded 301 cars of 8 cubic yards each in 10 hours, including 1½ hours' delay waiting for cars. The weight of this shovel is about 39 tons. It has been improved from time to time as the result of experience, and strengthened in various parts so that all weak points have been eliminated."

The engines were double 8"x12" using link motors and friction drums, the car 30 feet long and 10 feet wide, built on four 10" beams and two 10" channels. Propelling was by pitch-chains to both forward and rear axles. The mast was of cast iron with 2½" round iron side braces. The dipper carried 1¾ yards and was a one-piece steel shell.

Says, Mr. Jobe: "This shovel was bought by the Vandalia Railroad Company in the early nineties. George Meyers brought 146 to Terre Haute for Bucyrus.

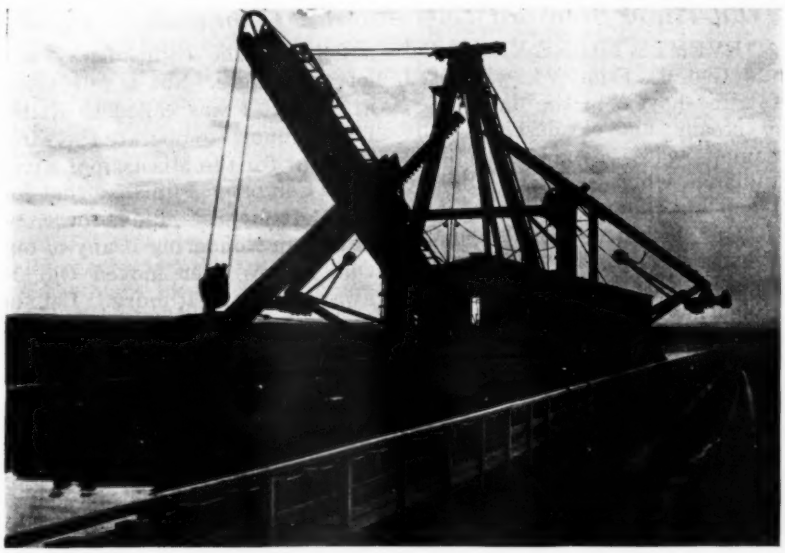
"The picture was taken in the summer of 1899. Joe Cromwell was engineer, Wm. Renfro was jerking the rope and I was boiling the water for them. I fired this shovel a long time for Mr. Cromwell. The Vandalia also owned number 98, a sister Bucyrus that worked on the Logansport Division.

"As they came down through the years these shovels were rebuilt many times and finally they put steam on the cranes."

Glad to have your contribution to the old timers column, Mr. Jobe. Let's hear from more of the boys who have pictures and stories of the early days of steam shoveling.

Old Timer J. W. Schaffer Sends This One

THE PHOTOGRAPH showing this unique old time dipper dredge floating across a bridge, comes from Old Timer J. W. Schaffer of South Milwaukee. Mr. Schaffer operated this 1½-yard Marion for the Alberta Railway and Irrigation Company in 1907 and 1908 on the irrigation canal near Lethbridge, Alberta, Canada. The job consisted of widening an old 12-foot canal to 45 feet at 5 feet water depth. The water came from St. Mary's Lake in Montana through the St. Mary's River, the canal branching off 15 miles below the lake.



The work was somewhat unusual in that it was nearly all side-hill work, the dredge digging a ditch into the bank on the high side and casting over to make a levee on the low side. The material was clay giving fairly good digging and an impervious bottom and bank. Farm lands in the irrigated area produce wheat and sugar beets. Snow-capped mountains in the distance add a beautiful scenic touch to the country.

In the two seasons Mr. Schaffer operated this dredge they completed 11 miles of enlargement.

The flume shown in the illustration carried the canal across Willow Creek. It was 40 feet wide and carried the water at a 5-foot depth across a span of 500 feet. Height was 70 feet above the bot-

tom land. The dredge was pushed across by hand, the crew of "pushers" walking along side on the board side walks or carrying tow lines ahead of the machine. The dipper was placed in a small scow to lighten the front end of the dredge and facilitate towing.

The bank spuds consisted of flat floats raised and lowered by hoisting cables. The one shown at the left was specially designed and built on the job to obtain satisfactory bearing on the lower side against the newly built levee.

We understand from Old Timer N. C. McGinnis that T. C. Clark of Owosso, Michigan also craned and operated this old timer.

Can any other Old Timers bring forth pictures of other special machines from the old days? And thanks, Old Timer Schaffer, for this most interesting picture.

Old Timer Richburg Worked With Inventor Kilgore

FROM Winchester, Massachusetts, Old Timer Ronald G. Richburg writes:

"I have just read in your Old Time and Old Timers section an article about 'More on the Kilgore Shovel.' I would like to ask if you could send me your April issue of this magazine as I would like to read the article which was published in it regarding the Kilgore shovel. Its mention brings old memories back to me. I used to work for Frederick O. Kilgore when he was running a machine shop in Brookline, Massachusetts about 1917 or 18. I was the only one in the shop with him and he used to show me blue prints, etc. of his shovel and tell me about how he tried to get the government to give him money to build them and send them to the Panama Canal. He was a very nice old gentleman and I guess he was quite along in his years when I was working for him as a shovel engineer. I have always been interested in shovels but have never heard anything about the Kilgore shovel or knew of anyone who had until reading this article. Could anyone tell me where Mr. Kilgore is now? I would appreciate it very much if someone could."

Can any of our Old Timers give us news of Old Timer and Inventor Kilgore?

Status National Recovery Highway Funds

The following tabulation shows status of N. R. federal-aid projects October 16, 1933 according to information from Bureau of Public Roads, U. S. Department of Agriculture.

State	Total No. of Projects Approved	Amounts Obligated	Estimated Employment	No. of Projects Awarded
Alabama	24	$ 2,548,000	1,825	9
Arizona	34	3,768,000	3,065	21
Arkansas	14	576,000	428	7
California	68	9,725,000	7,165	48
Colorado	30	2,048,000	2,115	23
Connecticut	5	584,000	900	
Delaware	18	971,000	1,350	12
Dist. of Col.	12	1,463,000	1,570	8
Florida	26	2,185,000	1,865	12
Georgia				
Idaho	51	3,058,000	2,831	41
Illinois	24	1,005,000	1,610	
Indiana	16	2,274,000	2,910	10
Iowa	82	5,653,000	5,212	61
Kansas	79	2,450,000	4,180	26
Kentucky	45	2,573,000	3,932	17
Louisiana	18	2,423,000	1,811	9
Maine	141	2,162,000	8,915	138
Maryland	6	820,000	680	2
Massachusetts	16	2,270,000	2,308	14
Michigan	39	2,098,000	3,373	21
Minnesota	172	5,402,000	6,600	147
Mississippi	19	1,239,000	1,110	6
Missouri	87	4,805,000	6,244	61
Montana	62	4,744,000	4,405	33
Nebraska	83	4,106,000	7,743	68
Nevada	20	1,879,000	1,705	13
N. Hampshire	10	598,000	915	7
N. Jersey	10	1,601,000	1,925	6
N. Mexico	32	2,205,000	2,215	29
New York	157	18,897,000	21,043	100
N. Carolina	63	3,062,000	4,010	44
N. Dakota	89	2,021,000	5,135	42
Ohio	117	7,795,000	11,710	65
Oklahoma	56	3,418,000	3,418	48
Oregon	74	4,883,000	3,930	43
Pennsylvania	117	4,443,000	6,940	65
Rhode Island	8	968,000	1,105	8
S. Carolina	38	1,795,000	2,655	20
S. Dakota	56	2,089,000	3,816	31
Tennessee	22	1,923,000	2,085	9
Texas	157	7,557,000	10,473	82
Utah	53	2,818,000	3,824	46
Vermont	19	686,000	1,613	11
Virginia	64	2,986,000	3,977	21
Washington	60	3,542,000	3,310	31
W. Virginia	40	2,301,000	3,145	28
Wisconsin	83	4,558,000	6,705	76
Wyoming	69	3,375,000	2,753	59
Total	2,596	$157,649,000	193,879	1,684

Old Timer Stanford Tells About a Thompson-Bucyrus

SEVENTY-THREE-YEAR old Geo. L. Stanford, who used to run shovels in the days when a steam shovel deserved the name, writes from Bloomfield, Indiana where he's trying to teach his rheumatism to behave.

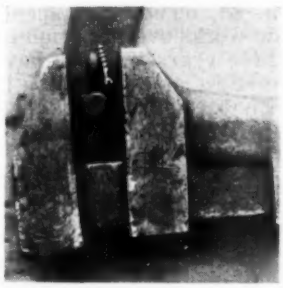
"On looking over the Old Timers remarks in your October issue of Excavating Engineer, recalled having had the luck to operate Shop No. 50 Thompson-Bucyrus for Cap Ware of St. Louis, Missouri, at Wooward, Iowa. Charles Vanbramer was craneman—I forget the fireman's name—but Mr. Callighan was superintendent.

"We finished the work at that place and ran the Old Mill out in a field off the right-of-way and left her there. But a few years after that I was called to Keithburg, Illinois, to operate the same old boat for the Mississippi River Sand Company. I finished that job and left her standing there, so now I am wondering if any of our Old Timers ever moved Old 50 away from Keithburg. Let us hear from all of you Old Timers. I certainly would like to hear about what became of that good old rig. The last time I saw her was in 1908."

Thank you Old Timer. Hope we can get news of old 50's final resting place for you. And may your winter be a pleasant one.

FIELD NOTES

Thumb Nuts Removed Without Breaking Wings



ORDINARY cast iron thumb nuts so commonly used about many types of machines are often removed with the usual monkey wrench, for invariably one runs into the necessity of taking them off when such a tool is the only one available. The jaws of the monkey contact only the tips of the wings and as a result one or both wings are frequently broken off in the process. If you can get a small wood screw, use it as shown with the wrench. You will not break the nut wings, and at the same time you will get the nut off easily. One side of the sharp screw head catches close to the body of the nut, the other side of the screw holds tightly on the face of the wrench jaw, while the ends of the wings are contacted lightly if at all. You get a solid turning grip which will loosen any thumb nut that will turn at all, without a chance of injuring it.

Frank W. Bentley, Jr.

Use Care in Charging Sprung Bore Holes

A DANGEROUS practice in use occasionally today is loading bore holes with black blasting powder immediately after the hole has been sprung or de-watered with dynamite, according to the Institute of Makers of Explosives. This occasionally results in premature ignition of the black blasting powder and is thus responsible for accidents.

In open pit operations where deep holes are sprung, the danger of causing premature explosions by loading explosives in a sprung hole too soon after springing is well recognized. In fact, many operators issue very definite instructions to allow sufficient time to elapse before adding another charge of explosives, after each springing of the bore holes. It appears, however, that in open pit coal blasting where only small charges are used in blasting coal, this danger is not fully recognized.

In every case where a hole is sprung, definite instructions should be given to allow sufficient time for the hole to cool to a temperature well below that which may ignite the explosives, before adding more explosives.

The temperature of explosion of high explosives is extremely high. The temperature produced is considerably above the temperature required to ignite black blasting powder, or in fact any other commercial explosive. Part of the hot gases produced by the explosion not only remains in the bore hole, but heats the surrounding walls of the hole to a certain extent. If an explosive is put in the hole immediately after springing, the high temperature very probably will ignite the charge.

Evidence of Fault in Filling Excavations

A WEEK OR SO after a sewer had been constructed to a depth of 25 feet, plaintiff's house on an abutting lot moved slightly forward and was damaged. A sidewalk and pavement near the sewer also sank.

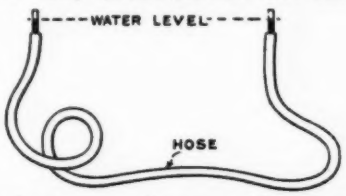
Plaintiff sued the sewer contractor and obtained judgment. On an appeal to the Michigan Supreme Court, the contractor contended that there was no proof that his fault caused the damage complained of. But the court applied a legal rule known as the "res ipsa loquitur" (the thing speaks for itself) rule. The rule is to the effect that where an accident happens under such circumstances as to raise a legitimate presumption that defendant was at fault, although the precise fault is not proved, he may be held liable unless he disproves fault on his part. This constitutes an exception to the general rule that one suing for damages has the burden of proving in what precise particular defendant was at fault. Said the court (Oleksza v. Nolan, 241 N. W. 807):

"By force of circumstances, plaintiffs were not able to trace the moving of the house unequivocally and directly to a specific act of defendant. However, the testimony was that two possible conditions could have caused the ground to shift: That the contractor neglected to fill in with earth around the tunnel during construction, and absorption of moisture through the brick of the sewer, the ground being of a soft, damp character. The contractor himself did not think the latter condition responsible for the damage. There was evidence of voids around the tunnel which could have caused it. It is but an application of the doctrine of res ipsa loquitur to find negligence from a condition which is shown to have existed and which could have caused the damage, and all other possible explanations are excluded.

"The circuit judge, on a view of the premises, was of the opinion that the weight of the building did not cause the ground to move, but that the land shifted because of the contractor's failure to take reasonable precautions. . . . In our opinion, the verdict cannot be said to be against the preponderance of the evidence and judgment is affirmed." —*Arthur L. H. Street, Attorney at Law.*

Accurate Leveling Kink

THE SKETCH accompanying this field note shows how easy it is to do an accurate leveling job. Slip gauge glasses into each



end of an ordinary rubber hose and fill with enough water so that the level will show in each class, as indicated. With this simple device you can level anything, and accurately.

When filling the hose with water, care must be exercised to be certain that all air is gotten out of the hose. Hold it in a U-position when filling. Do not fill it by immersing the hose in a tub of water. Also, one end of the hose must not be warmer than the other end. If the water in one end is warmer it will occupy greater volume and the level will not be true. In other words, get rid of all of the air and use the water of the same temperature throughout.

—*W. F. Schaphorst, M.E.*

EXCAVATING ENGINEER
FOUNDED 1907

A Monthly Publication Devoted to Excavating and Allied Subjects

REGULAR SUBSCRIPTION: $1.00 a year; Canada, $2.00 per year. SPECIAL SUBSCRIPTION: Upon application on card inserted in this number, Excavating Engineer will be sent frequently (not regularly) free of charge. Only for those engaged in the industry of excavation.

The Excavating Engineer Publishing Co.
South Milwaukee, Wisconsin

F. O. WYSE
Managing Editor

ARNOLD ANDREWS
Editor

E. M. HEUSTON
Advertising Manager

Printed in U. S. A.

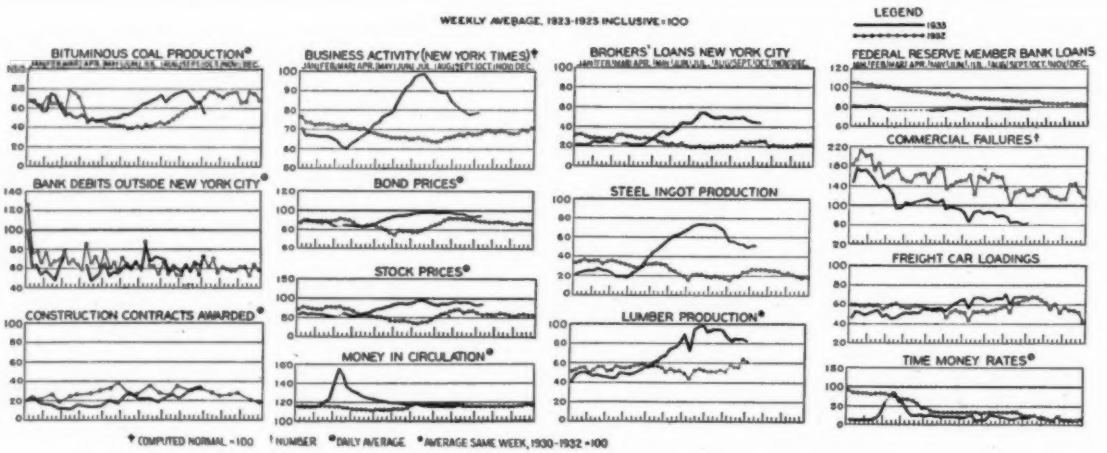
The Business Situation

THE PRESIDENT'S radio announcement of October 22nd, with its promise of controlled increase of commodity prices until they reach the 1926 level, and its promise of following that increase by management of our currency, is very reassuring. Control of currency value by the buying and selling of gold is a reasonable economic program and the president's promise is a commitment of the administration which will make it well nigh impossible for a dissatisfied congress to force the chief executive's hand. There has been, in the past, some feeling in certain quarters that inflation of any kind with its anticipated accompanying wave of improved business sentiment, was desirable. Newspapers have been agitating increase with no differentiation between controlled inflation of commodity prices and uncontrolled deflation of currency value by the somewhat convenient expedient of issuing currency with doubtful security back of it. We now have a definite statement from the president and we find the press of the country differentiating between controlled and uncontrolled inflation — another healthy sign that is an effective assurance that we have a great deal less to fear from the possibility of dangerous legislation upsetting the more conservative policy of the president.

One of the unfavorable signs of the moment seems to be the rising cost of production with little accompanying increase in consumption, a combination of events that could not take place under the normal law of supply and demand. It seems to come about as a result of the governmental regulation, under which industry is working today. Perhaps the real cause of this is the fact that most of the administrative work done to date in an effort to speed up industry, has been of a nature which, while it would help improve conditions in the consumption goods industries, would have little effect on the condition in the capital goods industries. Thus, while all industry has "lined up" behind the administration in regard to wages and hours of employment, the resulting increase in volume has been somewhat disappointing because it has come mainly to the consumption goods production industries. The trouble is that capital goods are scarcely ever purchased out of current income. They are usually a commitment against future earning power, they are almost always bought by credit—borrowed purchasing power. Even $3,300,000,000 spent for public works over a period of two or three years will not have the same effect as an increase in optimism throughout the land, although the expenditure of that amount may help considerably in the generation of the needed optimism.

Probably the most effective index we have for the sentiment of the public toward fixing capital is the index curve for "new bond issues." An increase in the volume of new bond issues reflects optimism on the part of the public—indicates an increased willingness, on the part of those owning capital, to invest it in construction in the hope of gain. It seems today as if the greatest hindrance to the rise of this curve is found in the provisions of the Securities Act which place such a burden of proof upon the entrepreneur as to form an effective restraint on the promotion of new projects. It is noteworthy that after an almost steady drop from the middle of 1930 to date, the rate of fall of the "new bond issue curve" has fallen almost to zero. It now remains to be seen whether returning optimism and faith in the soundness of our financial and industrial structure will bring about an increase in new bond issues in spite of the

WEEKLY BUSINESS INDICATORS



provisions of the Securities Act or whether it will be necessary to change some of the requirements so that private capital can become available for construction of various kinds without placing such tremendous burden of proof upon the honest promoter.

In spite of the pessimistic sentiment we find at the moment, public sentiment is apparently still improving. We cannot lose sight of the fact that just as we "came down into" the depression by a series of hills and valleys, so we will come to better times in the same manner.

It will be remembered that on the way down the dips were steeper and longer than the rises. It can now be expected that on the increase the rises will be longer than the recessions, but the point to bear in mind is that the recessions will be present and should not be taken as indications that no further improvement can be expected.

An example is furnished by the recession at the present moment: from March to July the business activity index of the New York Times rose from 60 to practically 100 in 17 weeks and since then, in the 10 weeks that followed, has lost one-half of the advance. This recession is, unquestionably, a little disappointing but certainly not cause for wide spread pessimism.

Canopy Used in Postoffice Job

(Continued from Page 451)

leans against the boom until danger is past. As an indication of the safety factor, a single shot was made while the writer and Mr. Carrier stood, unintentionally, however, within twenty-five feet of the canopy.

Mr. Carrier was assisted in the supervision of the work by G. A. Ellis, excavating engineer. The work included the removal of sewers, gas and water mains, and electric and telephone conduits from one block of Tenth Avenue South, which had been closed and condemned as a part of the building site. Bucyrus-Eries were used in breaking up foundations and lifting out big portions of concrete basement floors as well as ripping up paving.

Traffic control speeds operations

Since the location fronts on busy Broadway, and at times only one entrance could be used, a traffic system was worked out which made it possible for trucks hauling not only dirt and rock, but other building materials to come and go. Mr. Ellis worked out the traffic scheme by providing an officer at the entrance to control Broadway traffic and a parking space in the enclosure where trucks either waited to deliver materials or to back up to a shovel for a load of rock or dirt. The system worked with clockwork precision.

Frank Messer and Sons of Cincinnati are the General Contractors with E. V. Willing in charge. As mentioned, the Carrier Wrecking and Excavating Company of Flint, Michigan handled the excavating and R. L. Stockard and Son of Nashville, with Indiana trucks did the hauling.

The excavation work was started on the Nashville post office job on June 20, and was completed with the exception of minor digging and trimming in about seven weeks working time. The entire job is scheduled to be completed by July 1, 1934.

Heading Off "Old Man River"

(Continued from Page 450)

thousand pounds and the smaller which controls the gate at the takeout for irrigation, handles six thousand with ease.

A thirty-six inch skimmer wall was built in the takeout box thus preventing silt and drift from entering the irrigation canal and clogging its flow. Due to the force of the water coming down the main canal a six-foot splitter wall was constructed in the return basin to break the force of the flow.

The heading itself, as a whole, functions very simply. Water enters at the upper flood gates at the dam. It flows through the large, concrete canal until it reaches the gates and basins. If irrigation water is needed, the return gate is closed and the takeout is thrown open allowing the water to enter into the huge Arenal Canal which carries it on to the many smaller takeouts down the valley. If sufficient water is already in the Arenal, the takeout gate is closed and the return gate is opened, permitting the water to return to the river sluiceway and be carried through the channel back to the river. At all times a body of water at a depth of eight feet is running in the main canal and is ready for instant use by the mere opening and closing of gates.

Another 50-B Diesel is snapped while driving piling along the river bank.

Possibly, for some, it will be difficult to understand the value of this heading but to the farmer in the Rio Grande valley who depends solely upon artificial distribution of water through ditches, it assures ample water supply during the early spring and summer months when the sun beams down upon his crops and burns them to the roots.

Sixteen draglines do the work for the Conservancy and their goal is a million yards per month. At the present time the record for moving earth is held by machine number 127, a Bucyrus-Erie 50-B, operated by Bill Snyder, W. E. Kelley and E. F. Odle. This machine is powered by an Atlas Imperial Diesel motor of the four cylinder type and from all indications this machine will hold the record for some little time.

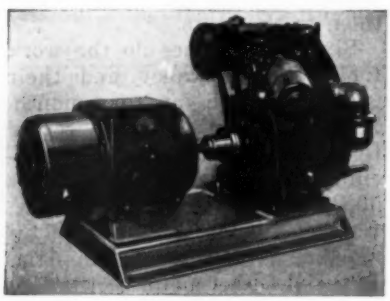
Three more headings are planned and work on two of them has already begun but, to the farmers in the particular district where they are going in, they cannot be completed too soon as the withering rays of Old Sol this summer took toll of their crops and they are clamoring for water — and plenty of it!

EQUIPMENT
You Ought to Know About

Harnischfeger Develops Line of Lighting Plants

AN INTERESTING development in the field of electric generating units recently perfected by the *Harnischfeger Corporation, Milwaukee, Wisconsin,* is a line of portable lighting plants. This line consists of small, heavy duty lighting units of a one or two cylinder gasoline engine directly coupled to a compound wound, continuous generator. Push button or manual starting is available.

Capacities range from 400 watts to 3 K.W. generating 35 or 120 volts direct current. Greater capacities are provided for by 4 and 6 cylinder gasoline generator sets with a current range of 1½ to 60 KW. In addition to these gasoline driven sets, Diesel power is also available. The Diesel engine operates on cheap fuel oil and consumes less than half the amount of fuel necessary to operate the gasoline engine. These modern Diesel generator sets are built in capacities of 35 and 50 KW, Alternating or Direct current. Because of the large capacities of these units, electric lights and appliances may be operated simultaneously. Features claimed for the line are high re-



serve capacity, economical operation, simplified design and continuous non-flickering current.

These generating sets are being marketed by the newly organized electrical division which is now handling the Hansen Arc Welder, a new line of electric motors and heavy duty controllers. For further information write the manufacturer, mentioning *Excavating Engineer.*

Gardner-Denver Announces New Wagon Drill

ADAPTED to most drilling on highway and railroad work and wherever holes twenty, thirty and thirty-five feet in depth are required, is the new WD2 Wagon Drill recently announced by *Gardner-Denver Company,* Quincy, Illinois. On the wagon drill the big 3½ and 4-inch Gardner Denver drills can be used.

The manufacturer reports that two men on a new WD2 can drill over twice the daily footage they could put down using hand held drills. In rough ground, holes may be spotted and collared easily because of the quick acting convenient centralizer. The air hoist throttle and the drilling and hoist throttle and the drilling and blowing controls are all within easy reach of the operator. Only one string of pipe and one piece of hose are necessary from the compressor to the drill as compared to many lines with jack hammer installations.

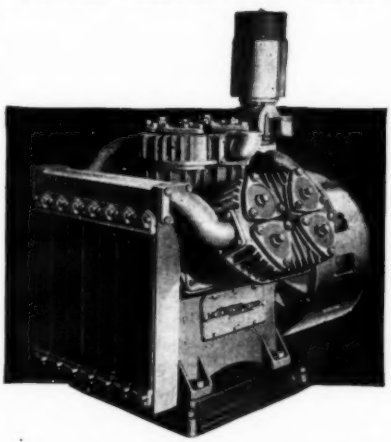
The wagon is strongly constructed; wheels are carried well forward to eliminate the danger of upsetting when pulling a tight steel with the air hoist. When used with extra long steels, the outfit can be equipped with a hand winch with cable and steel puller for raising and lowering the steels, and with an extension and guide by which they can be safely handled. A substantial tow-bar with swiveling wheel makes it easy to move the rig from place to place. For full particulars, write Gardner-Denver Company, mentioning *Excavating Engineer.*

New Air-Cooled Air Compressor

A NEW type of air compressor which requires no cooling water and which is accordingly particularly adapted to certain applications where water is scarce has been developed by *Ingersoll-Rand Company,* 11 Broadway, New York City.

The new machine, called the Motorcompressor has a built-in motor. The motor rotor is carried on the compressor shaft and the motor frame is bolted directly to the compressor crankcase. This construction eliminates a coupling, as well as motor bearings. A rigid sub-base underneath the entire unit makes a compact machine.

The Motorcompressor is a 2-cylinder, 2-stage machine. Cylinders and intercooler are air cooled. Units are built in sizes from 20 to 50 hp., with piston displacements from 113 to 310 cu. ft. per minute and for discharge pressures up to 125 pounds gauge. The overall efficiency is equal to or better than in conventional water-cooled compressors of corresponding capacities. It is designed to meet the need for an efficient, moderate-size, motor-



driven, air-cooled compressor. It can be used for general service or as a standby unit wherever air is required, but is especially suited for locations where water cooling is objectionable or out of the question because of the freezing hazard or for other reasons. A descriptive catalogue may be obtained at any Ingersoll-Rand office.

SHOTS from the Firing Line

Highway Contractor's Code

A SEPARATE code for highways on which the American Road Builders' Association has been working is to be effected through joint action of the Associated General Contractors of America and the American Road Builders' Association, subject to the approval of the National Recovery Administration.

For the purpose of bringing about such a code prepared, sponsored and administered by the highway contractors, it has been agreed that the Highway Division of the Associated General Contractors and the Highway Contractors' Division of the American Road Builders' Association will jointly sponsor and take the initiative in the preparation of such a highway contractors' code. This proposed code will be supplemental to the general contractors' and construction industry codes. This procedure, of course, mean a new beginning in the preparation and submission of a proposed highway contractors' code for the highway construction industry.

The general plan of procedure is the appointment of a committee for a code for highway contractors. This committee will consist of approximately 30 members, who will be appointed by the chairman of the code committee for general contractors and will be made up of an equal number of representative highway contractor members of the American Road Builders' Association and the Associated General Contractors and non-members, who are geographically located throughout the country.

This code committee will meet in Washington at an early date to draft a highway contractors' code, which will then be sent to highway contractors of the country for their criticism and suggestions. The code will then be redrafted and, if necessary, be the subject of a general meeting, after which it will be properly submitted for the National Recovery Administrator's approval as the proposed code for highway contractors.

This is a cooperative procedure to simplify and facilitate arrangements before the National Recovery Administration and to consolidate the code activities in the highway industry.

Bidding October 25th on Three Million Yard Reclamation Project

BIDS were opened October 25th for construction of earth work, concrete lining and structures on the North Canal between stations 513 to 2051 and on the Mitchell Butte lateral of the Mitchell Butte division of the Owyhee project. The work is located near Nyssa and Ontario, Oregon, on the Oregon Short Line Railroad.

The principal items and estimated quantities involved are: 2,990,000 cubic yards of all classes of open-cut excavation; 96,000 station cubic yards of overhaul; 12,700 square yards of trimming canal and lateral sections for concrete lining; 52,900 cubic yards of backfill; 3,230 cubic yards of concrete in structures; 1,110 cubic yards of concrete in concrete lining; 2,225 square yards of dry-rock paving; placing 312,500 pounds of reinforcing bars; erecting 59 M. feet B. M. of timber in bridges; laying 2,600 linear feet of 15-inch and 42-inch lockjoint concrete pipe; and placing 29,000 pounds of gates and gate hoists. Materials are to be furnished by the Government. Full particulars may be obtained from the Bureau of Reclamation offices at Ontario, Oregon, Denver, Colorado, or Washington, D. C.

Bids also will be opened on November 7th on this same project—North Canal, Station O (Tunnel Canyon) to Station 513. The principal items and estimated quantities involved are: 14,120 cubic yards of all classes of open-cut excavation; 12,000 cubic yards of tunnel excavation; 5,750 cubic yards of backfill; 8,325 cubic yards of concrete in structures; 630 cubic yards of concrete in canal lining; 3,180 cubic yards of concrete in tunnel lining; 700 square yards of dry-rock paving; placing 1,297,000 pounds of reinforcement bars; and installing 41,500 pounds of gates, gate hoists and operating mechanisms. Full particulars may be obtained from the same source as listed above.

Treasury Cracks at Racketeering by Certain Washington Attorneys

THE TREASURY Department will look with much disfavor on those architects or engineers who retain legal counsel in Washington to aid them in securing professional contracts from the Department; in fact, it will be the disposition of the Department to eliminate such architects and engineers from consideration altogether. This announcement was recently made by Assistant Secretary of the Treasury Robert who has requested the American Institute of Architects and American Engineering Council to make the attitude of his office widely known.

Early in the summer the Treasury Department learned that certain Washington lawyers had been soliciting engineers, architects, and others, interested in obtaining Government business, representing that to retain such counsel would enhance the opportunities to obtain desirable contracts. This activity has been particularly prevalent in western states.

The Treasury Department has not made the names of the lawyers who engaged in this practice public, feeling that probably they did not realize (1) that their proposal was in itself a reflection on certain Government officials; (2) that representation of the nature lawyers would provide could not possibly have any bearing upon the selections made by the Treasury Department.

The Department states its desire to make its selections on the merits of each case alone. There is no disposition to prosecute any of the parties concerned, but the Treasury does want it emphatically understood that such a practice will be outlawed.

Magnitude and Importance of the Highway Industry

PERSONS in the highway industry —particularly now, when highways are leading the Public Works end of the National Recovery Program—are often asked, "What is the magnitude and importance of the highway industry?"

An impressive answer to this question is furnished by J. L. Harrison, Senior Highway Engineer, Bureau of Public Roads, Washington, D. C., in an article appearing in "Engineering News-Record" for February 23, 1933, which is summarized as follows:

A Year's Business from Road Building

Nearly four million people depend quite directly on highway work for their livelihood.

Half, or 76,000,000 tons, of crushed stone produced by commercial quarries was used in road construction.

Four-tenths, or 41,000,000 tons of the commercial sand production was sold for road construction.

Road construction consumed 60,000,000 tons of gravel, or nearly half of the commercial production.

Of the 127,000,000 barrels of cement shipped, 70,000,000 barrels were shipped to road building operations.

Asphalts and asphaltic oils used in highway work amounted to 50 per cent of the total production of 5,000,000 tons.

About 15 per cent of the tonnage moved by railway consisted of road building materials and machinery.

The annual expenditure for road building machinery is $50,000,000.

And these are the large items only!

Casper-Alcova in Wyoming to Irrigate 66,000 acres of agricultural land

THE CASPER-ALCOVA project for which the Public Works Administration has allotted $22,700,000 to the Bureau of Reclamation provides irrigation power development and river irrigation. It is located in Natrona and Carbon Counties, Wyoming where the Seminoe reservoir will provide water for irrigation of 66,000 acres of agricultural lands in the vicinity of Casper, Wyoming.

Two dams are required. The Alcova diversion dam is an earth and rock fill structure across the North Platte River in the Alcova Canyon about ten miles below the Pathfinder Dam and about 30 miles above Casper, Wyoming. Preliminary plans call for a structure with a maximum height of 235 feet above the base of the core wall and about 181 feet above the river bed. This is expected to raise the water in the river about 169 feet above low water. The embankment will have an upstream slope of 3 to 1 and a downstream slope of 2½ to 1. Reinforced concrete wall carried from bedrock to the top of the embankment will furnish an impervious diaphragm and will be protected and drained by a rockfill of sandstone material. Drilling operations conducted at the Alcova dam site show bed rock at an average of 40 feet below the bed of the river overlain by sand and river gravels, granite and other hard rock cobbles and boulders. Foundations and abutments are of fine-grained and even textured sandstone. It is planned to use a 25-foot diameter diversion tunnel to be converted later for an outlet tunnel by installing butterfly gates. Spillway capacity is provided by a side channel spillway on the west side of the dam. The Alcova diversion dam is estimated to cost $3,339,000 and the main canal, which will lie to the west and north of the river and will run for a total length of 106 miles with an initial capacity of 1,130 second-feet, will cost $6,749,000. The lateral system which will include two laterals crossing the North Platte in siphons to supply water to the irrigable lands on the east side of the river will cost $2,077,-000 and the drainage system $1,980,000.

The second dam called the Seminoe will be located in the Granite Canyon of the North Platte between the Seminoe Mountains and the Bennett Mountain about 33 miles northeast of Rawlings, Wyoming. Here a dam raising the low water level of the river 185 feet will provide a storage capacity of 910,000 acre feet. The site of the planned dam lies in a narrow gorge, one abutment being of granite entirely exposed and the other partially so. The river bed has a cover of 25 to 30 feet of sand, gravel and boulders. In this location a gravity type concrete dam is proposed estimated to cost $3,750,000. Seminoe reservoir will provide needed water for the Casper-Alcova project and incidentally permit an annual power output of 150,000,000 kilowatt-hours with the cost per kilowatt hours generated at 2.4 miles. It will be possible to operate the reservoir for power purposes and redistribute its overflow through the Pathfinder reservoir a few miles down river. A preliminary estimate of the cost of the Seminoe unit itemizes the Seminoe dam at $2,750,-000, the power plant $2,280,000 and investigations, roads and right of way $120,000.

The project office for the Casper-Alcova project has not yet been established but preliminary studies are in progress looking to the development of plans and specifications for the various construction features. It is probable that the work will be let by contract but just when it will be ready for bidding is at this writing uncertain. It is certain that the Bureau of Reclamation will exert every effort to bring this project to the point where actual construction can be started at the earliest possible date and it is hoped that contracts will be placed early in 1934.

Missouri River Waters to Rejuvenate Dakotas

By E. R. BUELL

IMPROVEMENT of the Missouri river seems destined to provide much work for excavating engineers within the next three or four years. The recent allotment of some $25,000,-000 for a first year's work on the Fort Peck reservoir near Glasgow, Mont., as a part of the Public Works Administration program may be followed, it is said, by another allotment for what is known as the Missouri River dam and diversion project calling for extensive works in North Dakota.

This matter is already before the administration and may, before this appears in print, have the approval of the government since it has had a friendly reception on the part of the federal officials.

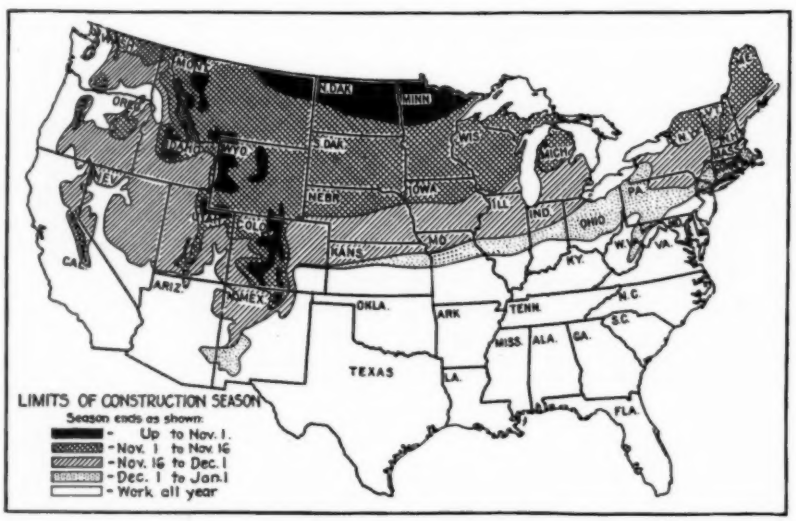
The latter project is one of the most unusual ever proposed in this country since it calls for the restoration of ground waters by sub-irrigation through replenishing of natural streams in an area roughly estimated at 20 million acres.

Several works are involved and the total cost is expected to run to $65,-000,,000. Briefly the plan is to build a huge dam in the Missouri river near Garrison, N. D., to store ten million acre feet of water in a great lake extending from that point 150 miles up the river bed to Williston, N. D., and to carry surplus waters across the nearby watershed by means of a 19 mile tunnel into the headwaters of the James and Sheyenne rivers.

In these rivers the waters would be controlled so as to cause a steady flow and also as to fill the great expanse of Devil's lake which has long been drying up and which is now only about one ninth of its former size.

The purpose of this work is described as drought relief by flood control. The great dam, two miles wide and 140 feet high, will give absolute control of the Missouri, halting the yearly floods

Save this Map



THE FEDERAL Emergency Administration of Public Works recently issued the accompanying map which shows the progress of winter weather that will tend to handicap actual construction operations. It is based upon U. S. Weather Bureau Statistics. On the basis that winter operations can be carried on as long as the mean daily temperature does not go below 30 degrees Fahrenheit the areas have been plotted to show the progress of winter conditions. Each section as indicated by the different shading is considered safe for operation up to the dates shown with the temperature to be expected ranging above 30 to 35 degrees Fahrenheit.

which have always done great damage each year and providing stabilization of water levels all the year round since the floods that are held back in the spring and early summer will be let out during the dry season as an aid to navigation.

From the top 35 feet of the stored water the tunnel will carry about 1,000 second feet daily into the two rivers which are now virtually dry and which supply the principal interior cities of both North Dakota and South Dakota.

The James river flows through the heart of South Dakota into the Missouri at Yankton and the Sheyenne winds through eastern North Dakota into the Red River of the North which is also virtually dry and, by means of a short cutoff, will be made to serve the cities of Fargo and Moorhead as well as Grand Forks and East Grand Forks on that river.

Seepage into the soil is expected to raise the ground water levels and conserve surface moisture so as to change entirely the character of the affected area restoring it to the well watered plain it was when settlement was first made there.

The ground waters have been receding so rapidly that suffering has been prevalent throughout the area with farmers forced to haul water for their stock and crop failures becoming more and more frequent owing to drought. It has been prophesied that the section would be uninhabitable in another 25 or 50 years and the departure of farm families is already reported from the state.

These facts are expected to move the public works administration to adopt the project since it calls for a large amount of excavating labor and the construction of several earth fill dams which will provide relief employment as well as agricultural benefit.

Imposing Membership List in Portland Cement Association 1000 Day Safety Club

THE qualifications of the Independence, Kansas plant of the Universal Atlas Cement Company, a subsidiary of the United States Steel Corporation, to the Portland Cement Association 1000 Day Safety Club, brings the current membership in this honorary organization to 15.

The membership as reported on September 25th on which date the Universal Atlas Cement Company's plant at Independence qualified, was:

1. Lehigh, Iola, Kansas
   C. A. Swiggett, Supt. 2573 days
2. Medusa, Toledo, Ohio
   W. J. Worthy, Supt. 1999 days
3. Medusa, York (White) Pa.
   R. J. Landis, Supt. 1474 days
4. Medusa, Manitowoc, Wis.
   F. E. Town, Supt. 1454 days
5. Canada, Ft. Whyte, Man.
   V. C. Hamilton, Supt. 1397 days
6. Canada, Exshaw, Alta.
   W. D. Armstrong, Supt. 1390 days
7. Trinity, Ft. Worth, Tex.
   A. A. Chaney, Supt. 1383 days
8. Superior, Concrete, Wash.
   H. A. Ambler, Supt. 1341 days
9. Hercules, Nazareth, Pa.
   J. S. Downs, Supt. 1323 days
10. Yosemite, Merced, Calif.
    A. P. DeJonckheere, Supt. 1201 days
11. Calaveras, San Andreas, Cal.
    R. H. Townsend, Supt. 1183 days
12. Ash Grove, Louisville, Neb.
    A. K. Frolich, Supt. 1136 days
13. Southwestern, El Paso, Tex.
    H. S. Sparks, Supt. 1036 days
14. Olympic, Bellingham, Wash.
    A. F. Krabbe, Supt. 1021 days
15. Univ. Atlas, Independence, Kas.
    C. M. Carman, Supt. 1000 days

The first five plants on the waiting list at that time were:

1. Penn. Dixie, Portland Pt., N. Y.
   F. P. Werner, Supt. 997 days
2. Univ. Atlas, Duluth, Minn.
   R. S. Huey, Supt. 990 days
3. Medusa, York (Grey) Pa.
   R. J. Landis, Supt. 953 days
4. Univ. Atlas, Pittsburgh, Pa.
   R. L. Slocum, Supt. 873 days
5. Alpha, Birmingham, Ala.
   H. O. Underhill, Supt. 845 days

Since this list was issued the Penn-Dixie plant at Portland Point and the Universal-Atlas plant at Duluth, have also qualified with a 1000 days of safe operation. We understand that there are about a half dozen additional plants which have run over 1000 days but are not active members of the 1000 day club at present.

Highway Construction Must Continue to Go Forward

By O. W. MERRELL, Ohio Director of Highways

In the matter of highway transportation, motorists and the public generally are inclined to take the attitude that, where a state has a fairly complete system of improved roads as Ohio has, the system therefore is adequate to meet traffic demands in a satisfactorily enough manner and hence can see no pressing necessity for the continuance of a widespread program of highway construction and improvement.

Such an attitude is false in that it fails to take into account several important factors. First, improved roads do not always remain improved roads—that is to say, they do not remain improved roads in the sense that they stay in their original improved condition. Deterioration sets in, as almost everybody knows, but few realize the enormous extent to which the highways are subject to this process of disintegration.

Not alone are passenger cars and commercial vehicles, especially trucks and mammoth buses, responsible for unceasing maintenance operations on an extensive scale. Their share, as a whole, is undoubtedly the greatest due to the constant wear and tear. But changes in climatic conditions exert a powerful disintegrating influence. Outstanding in this connection are heavy rains resulting in high waters causing landslides, undermining the strength of roadbeds and surfaces, and washing out bridges. Also correspondingly deleterious in effect is the thawing out after a freeze, leaving the roads in a condition less able to withstand the stress of dense volumes of traffic and the burden of heavy trucks.

Another important factor which motorists and the public generally are not apt to take into account is the fact that roads satisfying traffic needs when built are not capable of satisfying subsequent needs which may arise owing to various causes, such as unforeseen shifts in population and industrial expansion in certain areas.

Moreover, improved roads cannot be renewed forever through maintenance operations. Consequently new construction of old highways becomes mandatory along with the construction of new roads.

Highways stand in the front rank of present-day public utilities and necessities. As the state keeps progressing and advancing, so must the highway system—present roads must be altered and improved from time to time, old roads must be reconstructed and new roads must be added to the system on a basis of immediate and future need. Only by these means can the highway system efficiently and, in the long run, economically serve the motorists and general public alike.

Wage Rates in Sand and Gravel Code

THE REVISED Sand and Gravel code, which, at this writing, is awaiting the approval of the administration, provides an average work week of 40 hours for the six months from February 1st to August 1st and for the six months from August 1st to February 1st with a maximum of 48 hours in any one week and not more than six days in any one week. Clerical employees and employees employed

in delivery service are not to work more than an average of 44 hours in these same six-months periods with the same provision pertaining to 48 hours and six days in any one week.

The minimum rates of pay per hour for unskilled labor vary in different states, the rate being 40 cents except as follows: 30 cents an hour in Arizona, Arkansas, Kentucky, Louisiana, North Carolina, Oklahoma, Tennessee, Texas, Virginia, East West Virginia; 22 cents an hour in Alabama, Florida, Georgia, Mississippi, South Carolina; 50 cents an hour in California north of Tehachapi Mountains.

For crews on floating equipment engaged solely in transportation on navigable waters the weekly rate in board or lodging or money, or both, is to be $14.00 per week in the North and $13.00 per week in the South. The hourly rate for water boys is set at 50% of the hourly rates for unskilled labor. The wages of clerical and skilled labor are not specified but the provision is made "the minimum rates of pay for skilled and unskilled labor is to be equitably adjusted."

New England Notes

By E. D. COOGAN

Connecticut has started letting some contracts on the National Recovery Highway Construction Program and from all information available at the present time it appears that a good portion of this money will be allotted within the next sixty days.

Connecticut contractors have formed **a new association** which will eventually include a very large percentage of the bidders. This new association will work in conjunction with the Connecticut Highway officials in enforcing the provisions of the N. R. A. contractors' code, and due to this fact it should be much more influential in contracting affairs than any previous organizations.

James MacDonald, former Connecticut State Highway Commissioner, **addressed a recent meeting** of the association and was very enthusiastically received. Mr. MacDonald is past president of the American Roadbuilders Association and is considered the father of the United States system of highways. Although Mr. MacDonald is still very much alive and active the State of Connecticut saw fit to set aside a parcel of land on Avon Mt. as a public park and dedicated it to him. They have also constructed a very impressive granite monument with a bas-relief of Mr. MacDonald's head and shoulders on a brass plague which shows the esteem in which he is held by Connecticut citizens.

The Lee Construction Co. of Boston was the successful bidder on a bridge to be constructed over the Mystic River for the Massachusetts Metropolitan District Commission. The amount of the bid was $291,350.

Arute Brothers have started operations on their road job in Foster, R. I.

Their Bucyrus-Erie 43-B machine has just been moved to the job.

Amos D. Bridge's Sons, Inc., of Hazardville, Connecticut have a number of road jobs on which they are working in New Hampshire, Maine, and Connecticut.

At a recent Connecticut letting the **Lane Construction Corp.** of Meriden was the successful bidder on five highway projects.

Joseph P. McCabe of Boston was the low bidder on two road jobs in Maine, one at Wiscasset and one at Calais. At the same letting **Ralph E. Bull** of Fitchburg, Massachusetts was the low bidder on two jobs, one at Portland and the other at Lisbon.

The Edward Balf Co. is working on two sheet asphalt jobs for the City of Hartford.

New York and Vicinity

By G. E. PETERSON

The following jobs are included in work let by the New York State Highway Department since September 19th: **A. E. Ottaviano Company** of Croton, $184,743 for 4.42 miles of concrete in Dutchess County. This job included 116,000 yards of excavation. . . . **H. C. Schroeder** of Rochester, $203,620 for 6.8 miles of macadam in Cattaraugus County. . . . **D'Onfro Bros.** of Leominster, Massachusetts, $395,109 for 9.18 miles of 20′ concrete in Fulton County. This job includes 173,495 yards of excavation. . . . **DeBlasio Const. Company** of Mt. Vernon, $260,507 for 6.58 miles 20′ concrete in Rockland County. . . . **Lane Construction Company** of Meriden, Connecticut, $304,908 for 7.28 miles 20′ concrete in Jefferson County . . . **Thos. Brogan**, Yonkers, $193,497 for 2.57 miles of 44′ concrete in the City of Yonkers. . . . **R. Hopkins** of Albany, $147,172 for 4.09 miles 20′ Macadam in Sullivan County. . . . **Roadway Trucking Corp.** of Williamsville, $269,219 for 6.64 miles 20′ concrete in Oswego County. . . . **Nick Bonomo** of New York, $133,190 for grade separation in Queens County. . . . **J. F. Paddleford** of Sherbourne, $317,529, for 8.49 miles concrete in Oneida County. . . . **Law Bros.** of Herkimer, $156,619 for 4.29 miles 20′ concrete in Herkimer County. . . . **Bruno Cefalo** of South Wales, $190,279 for 12.27 miles 20′ concrete base with black top in Erie County. . . . **Anita Construction Company** of New Hyde Park, $125,914 for grade separation in Nassau County. . . . **Sheehan Construction Corp.** of Albany, $339,671 for 6.66 miles of concrete in Albany County. This job included 169,500 yards of excavation. . . . **Harrison & Burrow Inc.** of Brooklyn, $115,828 for paving in City of Oneonta. . . . **Lane Construction Co.** $196,351 for 2.49 miles concrete in Columbia County.

The Jones Beach Parkway Commission took bids on Oct. 17th for a Grade Separation job, low bid being submitted by **Johnson, Drake & Piper**, of Freeport, L. I. $115,209. This job includes 120,000 yards of excavation.

The first properties required for construction of the **Midtown Hudson Tunnel** between New York and Jersey have been purchased by the Port of New York Authority. These were at W. 35th and W. 39th Streets, Manhattan where the New York City entrance will be located.

Pennsylvania Notes

On **J. Robert Bazley's** coal stripping operations at St. Clair, Pennsylvania, this Bucyrus-Erie 120-B removes the solid rock which lays on top of the coal and loads it to these big eleven-yard Euclids hauled in a two-wagon train by a Caterpillar Diesel seventy-five, and also to Mack trucks which take their turn in the hauling fleet.

Delaware Notes

Snyder Engineering Company of Middlesex, New Jersey was low bidder with $27,085 for the Loockerman Street Bridge.

Old Line Construction Company of Chestertown, Maryland with $61,900 was low bidder on the 2.7 miles of grading and paving from Milton to Broadkiln. Included in the contract are 8,300 yards of excavation at 45 cents and 2,000 yards of borrow at 40 cents.

Virginia Notes

Contract for 1.17 miles of road, including a bridge, on the Yorktown-Jamestown Parkway, a part of Colonial National Monument in Virginia, went to the **Ruffin Construction Company** of Richmond for $17,876.

North Carolina Notes

By A. W. EDWARDS

The North Carolina State Highway and Public Works Commission have **had two highway lettings** since receiving the Public Works Fund, one letting being held on August 29 and the second on September 29. Both of these lettings featured penetration work, while the

Rugged

Efficient

Easily Handled

Enormous Capacity

Stiff-Leg Plow Control

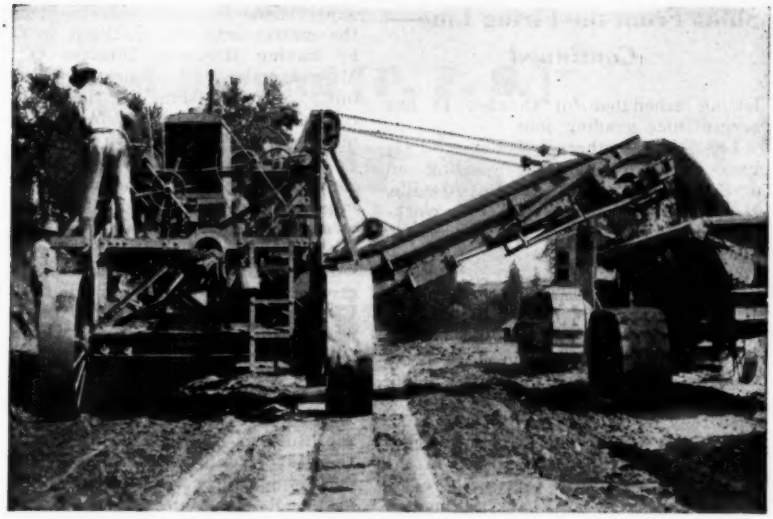
Three Point Suspension

Automatic Belt Control

Tubular Frame

Motor Driven Belt

One Piece Elevator



A Western No. 6 Elevating Grader making short work of loading a Western 7-yard Crawler Wagon, road contract of Anderson Bros. near Rockford, Ill.

THINK what these superior features of the Western No. 6 Elevating Grader mean in increased yardage and lower costs. See one of these machines in action and note the enormous stream of dirt pouring off the belt.

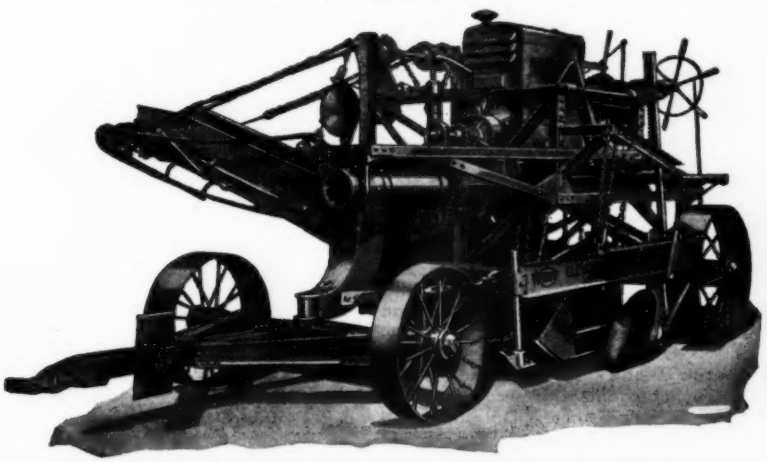
Get on the platform, put the plow down deep, and learn first hand how easily it handles.

Try it out in all kinds of soil; the No. 6 easily loads material so hard it could not be entered by a loose-hung plow.

And in addition, a simple attachment converts the No. 6 into the Western Shouldering Machine — giving two machines in one. Catalog 31-CK gives a complete description of all the mechanical features.

Write for a Copy Today

WESTERN WHEELED SCRAPER COMPANY
AURORA, ILLINOIS, U. S. A.



WESTERN

For your convenience in writing to Western Wheeled Scraper Co., you will find a card bound in this issue.

Shots From the Firing Line— *Continued*

letting scheduled for October 18 has several nice grading jobs.

Lavender Brothers, of Earl, N. C., have sub-contracted the grading on J. S. Bowers' work near Fayetteville, N. C., and have their steam Erie working. These boys seem to keep work in progress all along.

"Shorty" Ryan, a brother of Charlie, has gone in partnership with Roy Homewood, who is a member of the firm of Cobb & Homewood of Chapel Hill. The title of their firm is the **Ryan Contracting Company**. They are using a Type B Bucyrus-Erie steamer. To date they have dug several basements, and at the present time they are using the shovel **to extinguish a fire in the trash dump** for the City of Greensboro. Several years back while the Murray Construction Company of Knoxville was paving in Greensboro a fire got into the dump, and after using water for several weeks with no results Murray's shovel was put to work digging into the dump to reach the bottom of the fire. After this was done water was used and the fire extinguished. "Shorty" is now doing a like job for the City.

Belote Construction Company of Asheville, Mack Brown, Manager, and Mr. Quarterbaum, Superintendent, are doing the surfacing job for the State of North Carolina near Danbury, N. C.

Hodges & Eagle of New Bern, N. C., are doing the excavating for the Ethyl-Dow Chemical plant at Eure Beach, which is twenty miles south of Wilmington, N. C. This job called for the excavation for several buildings together with a trench from the ocean to the plant site.

Ohio Notes

Safety record of the maintenance forces for August in the twelve divisions of the State Highway Department throughout Ohio was 149 accidents among 15,001 regular employees and forty relief workers representing 930,886 total man hours, Highway Director O. W. Merrell announced. This was a reduction of five accidents over July when the accident total was 154. Highway Division No. 10, including Athens, Gallia, Hocking, Meigs, Monroe, Morgan, Noble, Vinton, and Washington counties, led in the number of mishaps with 23. The best record was made by Division No. 5, comprising Coshocton, Fairfield, Guernsey, Knox, Licking, Muskingum, and Perry counties, with only four accidents.

As the direct result of Governor George White's interest and concern in the improvement of secondary highways including some school bus routes, **Ohio will embark on an extensive program of secondary road improvement.** This program will come under the state's share of N.R.A. grant moneys to be expended by the Bureau of Public Roads on secondary road construction under State Highway Department supervision. Governor White brought the matter into the spotlight in Ohio by having Highway Director O. W. Merrell make a report on the practicability of using some of the national recovery highway funds for improvement of school bus routes in the interest of making travel safer and more convenient for rural residents. Many miles of secondary roads in Ohio, including school bus routes which might otherwise be impassable this winter, will be improved under an Ohio program to be submitted immediately by Highway Director Merrell to the Bureau of Public Roads.

Operator John T. Snodgrass of the Tasa Coal Company tells us the **Harmon Creek Coal Company** at Hopedale is making good progress in erecting the Bucyrus-Erie 225 purchased from the Mark Hanna Coal Company.

National recovery highway projects in 11 counties, representing **an expenditure of more than $570,000**, are included in the letting of contracts scheduled by Highway Director O. W. Merrell for Friday, October 20th. NRA highway contracts totaling **more than $5,000,000** have already been let by the State Highway Department at four previous lettings. Counties included in the October 20th letting are Ashtabula, Athens, Darke, Defiance, Fairfield, Hocking, Hancock, Holmes, Meigs, Monroe and Wyandot.

Michigan Notes

By CLYDE B. DAVIS

Governor Comstock has proposed to the Federal Public Works Administrator a **mammoth $25,000,000 sewage disposal system** to serve the entire Detroit area. It includes cleansing the waterfront from Gibraltar on the south to Port Huron on the north, a project that would employ 12,000 men two years. Power would be invoked under the clause in the public works act which provides for execution of existing international treaties. The U. S. Government entered into a treaty with Canada before the war to remove pollution from the Detroit river. It never has been executed. The local governments involved and the entire force of the state administration is backing the plan. A general meeting of all local governments involved will be held in Detroit, October 25.

Concurrent with the sewage plan, Detroit is submitting its own **$15,000,000 disposal project** which calls for a central plant at Fort Wayne. The city of Detroit also has placed before the county road commission a proposal for a $400,000 grant by the Federal government to finance a viaduct to carry Grand River Avenue traffic under West Grand Boulevard.

The city of Birmingham has included in its own public works program the **$29,000 Adams drain** which the county could not construct because of lack of money to pay for the engineering work.

Ten road construction contracts **totaling more than $235,000** were approved October 17 by the highway committee of the State Administrative Board. The projects include six in Flint at a cost of nearly $150,000; a bridge over Pine River at Charlevoix, $9,335, to Love Construction & Engineering Co., Muskegon; bridge over Red Cedar River on US 16, $15,879, to Fry & Kain, Inc., Lansing; bridge over same river at Fowlerville, $15,753, to John W. Hertel, Grand Rapids, and a $47,191 repair job on M 29 at Port Huron, to Michigan Asphalt Paving Co., Royal Oak. The contract for construction of 11.2 miles on M 78—the Lansing Flint air line trunk route—has been awarded to the J. A. Mercier Company of Detroit for $221,754.

Indiana Notes

By C. BRUCE McCOWN

Results of the **October 10th highway letting** are as follows:

Williston Construction Company, South Bend, $114,183 for 5.7 miles of paving on State Road 3—Lovett to Vernon in Jennings County. Also 0.9 miles paving on 31 at Carmel for $17,039.

Fargel Construction Corp., Evansville, $8,989 for 0.3 miles pavement at Newburg, Warrick County.

Central Construction Company, Campbellsburg, $108,992 for 10.5 miles on State Road 46 southeast of Bowling Green in Clay and Owen Counties. Excavation on this job runs about 200,000 cubic yards.

John Dehner, Inc., Fort Wayne, $40,200 for 3.7 miles gravel road on State Road 14 west of Collamor in Koscuisko and Whitely Counties.

Moellering Bros. Construction Company, Fort Wayne, $45,484 for bridge south of Linden, Montgomery County.

H. L. Maddocks, Newark, Ohio, $48,423, for bridge 4 miles west of Liberty in Union County. Also $20,266 for three bridges west of Bluffton in Wells County.

I. E. Smith, Richmond, $28,521 for bridge one mile west of Liberty in Union County.

Joseph Voto, Clinton, $14,006 for bridge west of Livonia in Orange County.

E. O. Jackson, Elizabethtown, $16,659 for bridge 4 miles southwest of Salem in Washington County. Also $12,462 for bridge over Brock Greek in Salem, Washington County.

A. G. Ryan & Sons, Chrisney, $7,558 for bridge in Georgetown, Floyd County.

Harold Thorpe, Fountain City, $17,174 for bridge at North Salem, Hendricks County.

Tri-Lake Construction Company has about half the concrete pavement laid on its job on route 9 near Columbia City, Ind. Excavation on this job was handled with tractor and wagons and Type A Bucyrus-Erie steam shovel. Harry Bollinger is supervising the work.

Brand and Deal of Columbia City are making good progress on their section of route 9 near Columbia City.

Style B Flattened Strand [P. F. S.]★

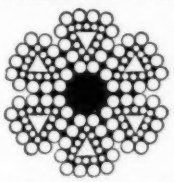
"HERCULES" RED-STRAND WIRE ROPE

REG. U. S. PAT. OFF

Has Many Exclusive Points of Advantage

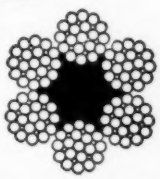
The remarkable performance records established by this wire rope are due to the combination of extra high grade material with a construction that provides many specific advantages.

Some of the chief features of the Flattened Strand construction are: (1) Size for size and grade for grade, it is 10% stronger than standard Round Strand construction. (2) On account of the small hemp center and the keystone shape of the strands it is not so easily crushed or mashed out of shape. (3) The outer wires in each strand conform to a circle, consequently this construction has more than 200% greater wearing surface than standard Round Strand rope, and because of its smooth outer surface it will not score sheaves and drums. (4) This type of wire rope provides a higher factor of safety, not only because of its greater strength, but also because its flatter and smoother surface between the strands themselves reduces the tendency of the strands nicking or cutting each other, thereby maintaining the original strength of the rope for a much longer period.



A Cross Section of a Genuine Style B Flattened Strand (P. F. S.) Wire Rope.

"Style B" Flattened Strand (P. F. S.) Wire Rope is made up of 6 strands of 25 wires each, but all 6x25 wire ropes are not the genuine Flattened Strand (P. F. S.) construction. Some 6x19 Round Strand ropes, in addition to the usual 19 wires, also have 6 small "filler" wires in each strand to make it more compact. These filler wires, however, do not increase the rope's strength, so when you are offered 6x25 wire rope, it will pay you to find out whether it is a "filler wire" construction or the genuine Flattened Strand construction.



A Cross Section of a 6x19 Round Strand Wire Rope Filler Wire Construction.

Actual results are the best yard-stick by which to measure wire rope value, and if you are not entirely satisfied with the amount of service you are now getting for each wire rope dollar that you spend, we would like to have you give this remarkable wire rope a chance to show you what it can do. We recommend it especially for use on heavy duty cranes, clamshell buckets, dredges, excavators, mine hoists and shovels. We shall be glad to give further information.

Made Only by **A. LESCHEN & SONS ROPE CO.** Established 1857

5909 KENNERLY AVENUE · ST. LOUIS, MO.

New York - - - - - - - 90 West Street
Chicago - - - 810 W. Washington Blvd.
Denver - - - - - - 1554 Wazee Street
San Francisco - - - - 520 Fourth Street

★ Reg. U. S. Pat. Off.

For your convenience in writing to A. Leschen & Sons Rope Co., you will find a card bound in this issue.

Shots From the Firing Line— *Continued*

Rosenbury and Gunnsallus are handling the excavation.

Roger Da'oust, Defiance, Ohio has completed most of the grading on his job west of Logansport. George Sparling, Fort Wayne, Indiana is loading and trucking the borrow on this job and is getting very good yardage from his GA-2 shovel. The GA-2 and a Northwest 105 are averaging better than 2000 yards per day.

Ralph Myers, Salem, has been whipping the dirt out on his job at Medora, Indiana. Ralph says, he has 40,000 yards of rock left and expects to clean up by January 1st. D. N. Evans is Superintendent on this job. W. D. Willoughby and J. H. Hensley are operating.

Robinson & Gregory and **Hart & Hart** of Columbus have about finished excavation on their job near North Vernon, Indiana. Using a P&H dragline and a Byers 1¼ yard shovel on this job. They have recently bid in two more jobs in Indiana and expect to have plenty work this winter.

E. J. Locke of the **Bedford Contracting Company** is on his third stripping job since purchasing his Bucyrus-Erie GA-3 shovel last July. Locke recently completed stripping the Dark Hollow quarry for the Heltonville Limestone Company in record time. Now is stripping for the Ingalls Stone Company near Bedford, Indiana. Locke is highly pleased with his Gas+Air. Johnny Hair is operating day shift and Paul Siebolt night shift.

Andrews Asphalt Company, Anderson, is putting top course on its job near Spencer. Have its plant set up at Andrews siding near Cataract, and is using one of its Bucyrus-Erie steam clams for handling materials.

By DAVID I. DAY

A number of road contracts were awarded in September and work is going forward on these various jobs. Project 313-A on State Road No. 13 between Noblesville and Strawtown in Hamilton County is the largest one in point of dollars and cents. This calls for 6.8 miles of concrete construction and was let to **The Grace Construction and Supply Company** at $163,887.

The Indianapolis company, **Berne Construction Company**, also was awarded a good 7-mile concrete highway contract at $149.336. This work is in Franklin and Union Counties from about 5 miles out of Brookville to Roseburg.

At Crawfordsville, the **McCoun Construction Company** of Noblesville has a short concrete road to build at a contract price of $29.364. The Fort Wayne contractors, **J. C. O'Connor & Sons, Inc.**, at a price of $127.713 were given the contract to build 5.36 miles of concrete road in Fayette and Union Counties. This work is on State Road 44 running out of Connersville. **A. B. Krempp & Sons** of Jasper has a paved side project totaling 30,600 feet linear in the Vincennes district at $20,146.50. A sodding project totaling about 15,000 square yards on State Road 31 in Marion and Hamilton Counties was let to **E. F. Luhman**, Muskegon, Michigan at $2,231.

All in all, the awards of the State Highway Commission were a cause of rejoicing for all who favor concrete roads, and were a sort of jubilee for the home contractors. There are some awards still pending and on one contract, all bids were rejected and the work will be done by state forces.

Six bridge contracts have been let by state authorities within the last few weeks covering nine spans in Marshall, Brown, Morgan, Vigo, and Jackson counties. The following are the contractors and the amount of work given each: McGrew & West, South Bend, Ind., $10,472; Goodwin & Harvey, Danville, Ind., $12,916; Mustard-Curry Building Corporation, Bloomington, Indiana, $19,113; Bergen & Bergen, Franklin, Indiana, $16,971; Vincennes Steel Corporation, Vincennes, Indiana, $3,385; Ralph Myers, Campbellsburg, Indiana, $5,742. The total of all this work runs to $68,600.

A lot of road work has been completed, more is nearing the completion date. **Everywhere the contractors report** work ahead of their schedule, and everybody is happy. This comment applies especially to the good work of A. C. Proudfoot, the Hammond contractor, on his concrete road job at Michigan City; the Gast Construction Company of Warsaw is moving on, at this writing, with their concrete road job from the Illinois line to Crown Point. Also good words are due H. L. Maddocks of Newark, Ohio for his work on bridges in Grant, Tipton and Hamilton counties, to Vincennes Bridge Corporation on a Warren County bridge construction, to E. R. Campbell, the Sandborn contractor for the bridge in Jefferson County.

Around 500 men are reported at work **widening on Highway 41** north of Evansville, an unemployment relief proposition.

Considerable storm has been generated **in Spencer County** where the County Commissioners retired quite a lot of county bonds and depleted the treasury to the extent that the entire county highway maintenance force had to quit work. As practically all of these men have families to support and winter is coming on, public indignation soon made itself felt. Petitions were being circulated criticising the officials and asking that steps be taken to remedy the present situation.

Doctor: "How often does the pain come on?"

Insolvent Contractor: "Every five minutes."

Doctor: "And lasts?"

I. C.: "Well, a quarter of an hour, at least."

Illinois Notes

Birt Bros. of Decatur contracted for moving 300,000 cubic yards of dirt from a building site for the A. E. Staley Mfg. Co. Above is shown their Caterpillar Diesel 75 tractor pulling a Caterpillar elevating grader and loading to Streich wagons which are hauled by a fleet of five Caterpillar 35's and a Caterpillar Diesel 50. It is reported that the Diesel 75 handling the grader consumed 3½ to 4 gallons of 7c fuel oil per hour.

Wisconsin Notes

By MORT HUNTER

Wisconsin's road program finally got under way with the award of the first road contracts the latter part of August. To date there have been four lettings, totalling about $2,400,000 worth of work.

The successful bidders to whom contracts were awarded at the first two lettings for mostly paving work were as follows:

Frank S. Tillman of Milwaukee—$125,492 for 7.019 miles of paving in Ashland County.

Walter W. Magee of St. Paul, Minn.—$111,374 for 5.46 miles of road in Washburn County.

Anderson & Sons of Minneapolis—$108,191 for 5.249 miles of road in Washburn County.

C. F. Sculley Equipment Co. of St. Paul—$121,954 for 5.841 miles of road in Washburn County.

Wm. Conway of Madison was awarded the Grant-Lafayette County job of 6.559 miles at $116,-684.

A. E. Bounsall of Kenosha was awarded 5.05 miles at $162,595.

Perry T. Fess of Madison was awarded the Lincoln County paving—4.499 miles at $96,583.

Streu Construction Company of Two Rivers got 6.127 miles at $122,525.

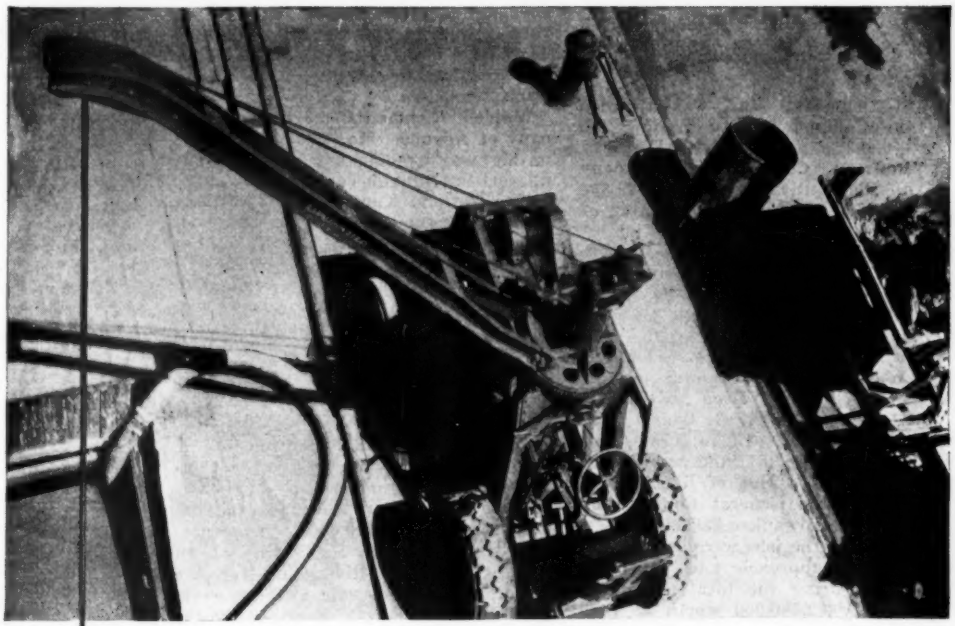
Wm. F. Hunt of Milwaukee got 3.85 miles at $135,857.

Interstate Construction Company of Madison got the first grading job of any size—134,645 yards of earth and 48,752 yards or rock—6.155 miles at $66,059.

The next grading job of any size to be let went to **William Lathers** of Madison at $47,470 for 128,528 yards of earth and 20,000 yards of rock—8.861 miles.

N. M. Isabella of Madison was awarded a paving job at LaCrosse—3.496 miles, at $64,418.

Jorgensen Construction Company



Cut handling costs *this new way!*

Put the Loadmaster on your job. Watch it place your materials handling on a profit-making basis, cut your yard and warehouse charges, speed up the placing of your steel, timber and machinery. This husky, compact, fast-working crane will load and unload trucks and cars; sort and pile stored materials; lift rock, pipe and transformers from and into trenches and manholes; serve machine tools; assist in overhauling and repair work. It will travel with its load and can be used as a tractor. It has no tail swing—operates in close quarters. Auxiliary units such as air-compressor, bulldozer, winch and magnet increase its usefulness. Write for complete specifications.

BUCYRUS ERIE **LOADMASTER**

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

For your convenience in writing to Bucyrus-Erie Company, you will find a card bound in this issue.

Shots From the Firing Line— *Continued*

of Denmark, Wis., was awarded the Calumet County grading job —6.463 miles at $31,197.

Hoffman Construction Company of Black River Falls got 79,356 yards of earth and 9,000 yards of rock—9.638 miles, at $37,796.

F. F. Mengel Company of Wisconsin Rapids got a small paving job in Wood County for 1.205 miles —14,507 yards of earth and 120 yards of rock.

Among the other larger jobs that have been let were grading jobs to **Nelson, Mullen & Nelson** (of Minneapolis) at $59,219; **A. B. Lynch Company** of Milwaukee $47,216; **J. W. Griffith** of Racine $78,857; and paving jobs to **James Cape & Son** of Racine $70,396; **Milwaukee General Construction Company** of Milwaukee $88,444.

The rest of the jobs were small grading jobs or approach jobs for overheads and bring the total up to approximately **$2,400,000 worth of road work let so far** this year in Wisconsin, which is about 1/7th of the work let at the same time last year.

South Dakota Notes

By PAUL G. FRIGGENS

South Dakota's highway commission is making **every effort to get its road improvement program under way as quickly as possible.** The Public Works Administration is trying to hurry actual placing of contracts as far as possible.

Although only 56 projects, expected to cost $2,089,000, have been finally approved, **more than $5,000,000 worth of work** out of the state's allotment of $6,011,479 from the federal government has been accepted by the special public works board in Washington.

A letting is planned the first week in November.

Of the program accepted by the Federal authorities $3,005,739 is allocated to Federal Aid highways outside municipalities, $897,750 to extensions of trunk highways into and through municipalities, and $1,100,000 to secondary roads.

Missouri Notes

By ERNEST W. FAIR

H. H. Ruddell of Springfield is completing a road project between Bradleyville and Protem in Tanney county.

Kelley and Underwood of Granby are building a culvert and bridge on Route V, Barry county, doing work in Madison county highways, and a $171,000 job on highway No. 54 in Audrian county.

The city of Wentzville recently voted a $45,000 bond issue to build a water plant and distributing system.

Joseph L. Pohl of Nevada, Missouri is completing highway work in Audrain county.

A. Guthrie and Company, Inc. of St. Paul, Minn. have been awarded a $262,689 contract for road and excavating work in Ste. Genevieve county. They have also begun work on a $223,000 project on highways in Saline county.

Malden, Richman Construction Company of Advance, Mo., has begun work on highway grading and earth removal work in Dunklin county.

The Gerland Knutson and Lay Construction Company has begun work on a $315,144 highway job in Jackson county.

The Brosnahan Brothers Company of Kansas City was awarded a seven mile highway job in Nodaway county on a bid of $195,590.

St. Louis and Vicinity

By A. J. KOENIG

A favorable report submitted to Secretary Dern for transmission to Congress and recommended by the chief of Army Engineers calls for the **expenditure of $245,000,000** to make possible navigation to Sioux City, Iowa on the Missouri River and for the building of a reservoir at Fort Peck, Mont. The plan was described by the War Department as "calculated to promote the prosperity of the Mississippi Valley as well as the country at large." The chief of engineers further recommended that the project for navigation on the main stem of the river as heretofore authorized, from the mouth to Sioux City, be vigorously pressed to completion.

The St. Clair County Highway department announces that it has provided **$350,000 for the building of two viaducts** in East St. Louis, Ill. One of the projects call for the spanning of the Pennsylvania and the Baltimore & Ohio railroad tracks at Kingshighway the estimated cost of which will be $100,000.

The Missouri Pacific Railroad has been authorized by United States District Judge Faris to expend **$1,833,512 for the improvement of tracks and roadbed.** Approximately $500,000 of this sum will be spent in Missouri within the next six months.

Contracts for paving and repairing **433 miles of highway were let** by the Missouri Highway Commission Sept. 23rd. The contracts were for the following projects: Three concrete paving and two oiling jobs on traffic relief roads. Fourteen concrete paving, one gravel surface and three oiling jobs on secondary roads. Forty-one gravel and repair jobs. Twenty-three gravel surfacing on Farm-to-market roads. Nine oil-mats on traffic relief roads. Bids for 10 miles of concrete paving in Carroll county were rejected because the bids exceeded the engineers estimate. The unusual specifications on above work called for the rental of special equipment from a private manufacturer at the rate of $1025 per month.

Bids on approximately **$800,000 highway work** were received at Jefferson, City, Mo. on Oct. 6th.

S. A. Healy, Detroit, was low bidder for the contract to build the Roller Gate Dam at Canton, Mo. The bid was $2,194,577. Six bids were received on this project. The Healy Company is now completing the Roller Gate Dam at Rock Island, Illinois.

The following low bids were received at the U. S. Engineers' office at St. Louis on Oct. 3rd for the construction of 2600 ft. piling dike at Chelsea-Pulltight, **Woods Bros. Const. Co.**, $84,660. 3000 linear ft. revetment Chesley-Pulltight, **Morrison-Glasscock-Connor Co.**, $81,970. 5000 linear ft. piling dike, Establishment-Sycamore-Harloe, **Woods Bros. Const. Co.**, $206,840.

The Zimmerly Bridge Co. was awarded contracts to build two bridges at Cambridge, Ill.

W. A. Ross Const. Co. was awarded contract for the construction of 10,650 linear ft. clump dikes and 3,780 ft. revetment on the Missouri River at Bon Ton Bend. **W. R. MacGeorge** has contract for 18,450 ft. dikes at Burr Oak and Wathena Bends, 700 ft. crib dikes at Burr Oak and Amazonia Bends, 5,350 ft. revetment at Burr Oak and Amazonia Bends.

The Kansas State Highway Department are receiving bids Oct. 19 on **156 miles of highway work.**

The St. Clair County, Ill. Highway Dept. awarded contracts for grading and paving to the following contractors: **Tritt Bros., Louis Rich Const. Co., A. P. Poirot, L. Sauget, Hoeffnen Bros., H. S. Moore and Parham Const. Co.**

G. E. Hoffman Co. has contract for placing 2,500 cu. yds. of earthwork in Pike county, Illinois.

W. A. Ross Construction Company of Kansas City, Missouri, was low on construction of 4,300 feet of pile dike and 8,000 feet of revetment on Rulo Bend on the Missouri River at a price of $222,651.

G. E. Hoffman Construction Company of Lincoln, Illinois, submitted the low bid of 29 cents for placing 191,200 cubic yards on the Black Bayou sublevee basin fill. Other bids ranged from 32.42 to 52.25 cents.

H. B. Whitney Company of St. Charles, with 16.9 cents as the unit price, was low with $5,746 for levee work on the Big Swan Drainage and Levee District. The government estimate was 21.632 cents per yard. Bids ran all the way to 53 cents.

River Notes

In issuing the **August report of the Mississippi River Commission,** movement of 14,281,441 cubic yards of contract work in all districts is recorded for that month. Since June 1, 1928, there has been placed on the flood control work on the Mississippi River and tributaries up to September 1st this year, a total of 364,386,426 yards. Of this total 346,302,376 yards has been placed below Cape Girardeau on the main river project while 18,084,050 was placed on the tributaries and above Cape Girardeau.

Revised minimum wage rates for levee camp laborers on N.R.A. con-

DIETZ LANTERNS

As a part of new equipment required for the vast road building projects now made possible by Government aid, provision for safety of the traveling public can best be insured by use of proven, standard warning lights — DIETZ RED LANTERNS and ROAD TORCHES.

Good Road Torches

R. E. DIETZ COMPANY
NEW YORK
Makers of Lanterns for the World Founded 1840

DIETZ LANTERNS

VERSATILE

You'll find the P & H-Hansen Arc Welder an ideal general purpose machine. It has so wide a welding range that it can be used for repairing heavy castings, for fabricating light tanks or structural steel — for any job that comes along. Operation is simple — only one control. Write for new catalog "Weld It Well."

HARNISCHFEGER CORPORATION · Established 1884
4517 West National Avenue, Milwaukee, Wis.

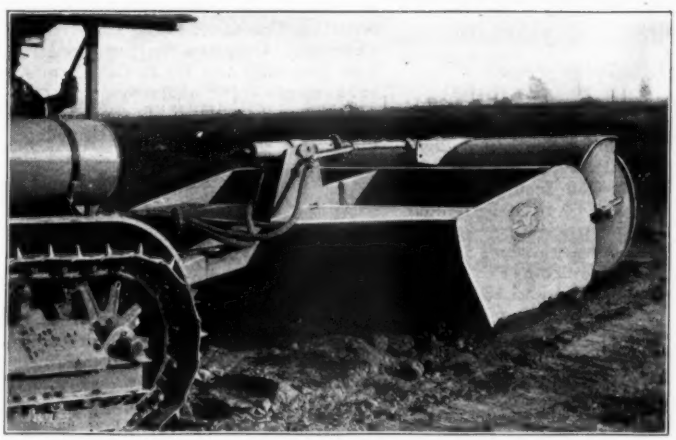
P&H-HANSEN ARC WELDER

AMERICA'S FINEST FASTEST WELDER

Cheap Dirt!!

With the Blaw-Knox (Ateco) Hydraulic DIRTMOVER

NRA WE DO OUR PART



- *Cheap Dirt*—lower and lower cost, per yard are being obtained on many throughout the country by contractors using the Blaw-Knox (Ateco) Hydraulic DIRTMOVER.
- Yardage costs such as $.0495 per cubic yard, and lower, dependent upon length of haul—are a matter of common record. We would like to tell you about contractors who are making real money out of all kinds of dirt moving jobs.
- Ask about the low cost DIRTMOVER —and the Hidden Power BULLDOZER, or the TAMPING ROLLER.

BLAW-KNOX COMPANY
2018 Farmer's Bank Bldg., Pittsburgh, Pa.
Offices and Representatives in Principal Cities

BLAW-KNOX

BLAW-KNOX

Shots From the Firing Line—
Continued

tracts are: **Skilled labor:** $1.00 per hour in Mississippi, Arkansas and Louisiana; $1.10 in Tennessee, Kentucky and Missouri; and $1.20 in Illinois; **Unskilled labor:** 40 cents, 45 cents and 50 cents in the same state groupings as above.

The following occupations are **classified as skilled labor:** blacksmith, boilermaker, canvasman, carpenter, chief electrician, chief engineman, craneman, deckman, master machinist, master mechanic (steam towers), tractor mechanic, dragline operator (all sizes) shovel operator, tower excavator operator, head powderman, welder.

Classified as unskilled labor are: belt adjusters, clearing men, dressers, dumpers, fresnoers, grease helpers, grubbers, light helpers, locomotive couplers, machine groundmen, plowmen, pumpmen, root pickers, sodders, trackmen, wagon winders, water boys.

A third classification of **semi-skilled labor** is set up and, while no rates have been specified as yet by the Public Works Administration, the following rates have been agreed on as just and reasonable by the Memphis Trades and Labor Council and the Mississippi Valley Flood Control Branch of the A.G.C.: for the states of Mississippi, Arkansas, and Louisiana: blademen, team drivers, tractor drivers, truck drivers, greasers, mechanic helpers, tail tower operators 45 cents; bulldozer drivers, loaders, oilers, grader operators 50 cents; firemen, blacksmith helpers, electrician helpers, machinist helpers 60 cents; elevating grader operators 68 cents, dinkey locomotive operators 75 cents, assistant mechanics 80 cents. In Tennessee, Kentucky and Missouri all these rates are upped five cents per hour, and in Illinois 10 cents per hour.

Officers of the National Remployment Service in Arkansas recently ruled that contractors moving to new jobs in this state **can only bring with them** a skeleton organization of executives, administrative and supervisory employees.

Contractors working on Federal Aid projects financed with NRA funds are **required to post their wage scale** in a conspicuous place on each job. The Mississippi Valley Flood Control Branch of the A. G. C. is furnishing printed wage scale cards suitable to this purpose to members without cost.

Memphis District

Six bids hooked up together and made contingent one upon another swept the Memphis letting October 6th to the tune of **15,444,000 cubic yards** at a total price of $3,615,592. Twenty-four other bids were received.

After studying all bids and combinations of bids, Major W. M. Hoge, U. S. District Engineer at Memphis, recommended that the award of contracts be made as follows:

Brooks-Calloway Company of Atlanta, Caruthersville, Missouri; Armorel, Arkansas; Long Lake, Arkansas, Butler, Arkansas levees totaling 3,041,000 cubic yards at 18 cents per yard; **H. E. Culbertson Construction Company of Cleveland,** Bledsoe, Arkansas; Moon Lake, Mississippi levees totaling 2,236,000 cubic yards at 29.73 and 22 cents per yard; **George W. Condon Company of Omaha,** Friars Point, Mississippi levee totaling 485,000 cubic yards at 22.60 cents and Oldtown, Arkansas, levee totaling 1,310,00 cubic yards at 22.40 cents; **A. Guthrie & Company of St. Paul,** Williamson, Arkansas levees totaling 3,193,000 cubic yards at 27.71 cents; **Callahan-Walker Construction Company of Omaha,** Oldtown, Arkansas levees totaling 2,213,000 cubic yards at 27.50 cents; **Clarke Brothers Construction Company of Clinton,** Snow Lake, Arkansas, Laconia, Arkansas levees totaling 2,966,000 cubic yards at 22.79 and 19.85 cents.

Another combination of Matthews Brothers Construction Company, C. J. List Construction Company, R. T. Clark et al, C. C. Aderholdt, Yale & Reagan and Benson-Kaiser Company, J. T. Pollard, Driver Construction Company, and Lewis-Chambers Construction Company in conjunction with the Government on two items, was $119,432 under the above combination. But the Chief of Engineers has ruled repeatedly that a Government bid cannot be used to break up a contractors' combination.

Nevertheless, Mike Morrissey, acting for R. T. Clark Company, Incorporated, Delta Construction Company, J. W. Noble and Morrissey Construction Company, filed a formal **protest against the recommended award** on the grounds that he and his associates were low on several items. He challenged the legality of the contingent bids.

At Memphis, **A. Guthrie & Company** of St. Paul took 300,000 yards at Stovall, Mississippi, for 17.75 cents. The next bid was 29.87 cents but the Guthrie organization happened to have the necessary equipment sitting right on the job where they completed an adjoining contract.

Vicksburg District

At **Vicksburg** seven contractors offered nine draglines on the U. S. Engineers rental bidding September 28th. Sixteen draglines were wanted, 6-yard or larger, booms 150 feet or longer, with crews, for use 60 to 120 calendar days. Dragline bids per hour, 24-hour day, five days a week, were: **Driver Construction,** $75; **Horton Price Construction Company,** $74 and $62; **Canal Construction Company,** $62.50; **W. E. Callahan,** $60, $58, and $100; **Callahan-Walker Construction Company,** $83 to $90; **Mike Mitchell,** $62.60; and **A. B. Cason,** $103.50. No bids were received on rental of two 24 to 27 inch hydraulice dredges which were also wanted.

At the **Vicksburg** letting September 20th for the construction of 5,655,900 cubic yards of levees in the Vicksburg District, 33 contractors submitted bids. There was a delay in announcing the award on the four sections of the Shipland-to-Fitler levee and a portion of the work on the Monroe-to-Sterlington levee was withdrawn. The successful bidders who received awards follow:

On the Monroe-to-Sterlington levee: **Henry Hughey Company, Incorporated,** of Memphis, 16,500 cubic yards at 26 cents; **Forcum-James Company** of Dyersburg, Tennessee, three sections totaling 1,220,000 cubic yards at 23, 22 and 21 cents; **Ayers & Graves,** Alexandria, Louisiana, two sections totaling 393,000 cubic yards at 18.3 and 15.3c; **E. E. Morgan** of Jackson, Mississippi, three sections totaling 320,000 cubic yards at 12.48; **J. P. Babcock,** Paris, Illinois, 65,000 cubic yards at 27.97; **Nils Desperandum, Incorporated,** of Delta, Louisiana, 50,000 cubic yards at 36. On the Monroe new levee north the latter contractor also secured 79,000 cubic yards at 40; **Meyer Greenwald Company,** Monroe, Louisiana, received two sections totaling 185,500 yards at 38.7; **Globe Construction Company** of New Orleans took two sections totaling 299,000 cubic yards at 25; **Linwood Smith,** Lake Village, Arkansas, took 22,500 cubic yards at 39 and **Henry Hughey Company, Incorporated,** Memphis, secured another 110,000 cubic yard job at 26. On the Monroe New Levee south the Hughey organization was also successful in securing two more sections totaling 174,000 cubic yards at 19; **Nelson Brothers** of Baton Rouge took 93,400 cubic yards on two sections at 40 and 48 cents; and **J. P. Babcock** secured his second job of the day, 85,000 cubic yards at 17.44.

Robertson & Young of Baton Rouge were low bidders at Vicksburg on the rental of a 1½-cubic-yard dragline with eight tractors and wagons at a price of $6.50 per hour for the dragline and $5.00 per hour for the tractors.

At Vicksburg, Major Larkin **contracted for the lease of four large draglines** for the Marshall Point, Willow Point and Worthington Point cut-offs at the bidding September 28th. Draglines were leased from Driver Construction Company, Canal Construction Company, Callahan-Walker Construction Company and W. E. Callahan. Arrangements were made to operate the machine seven days of the week instead of five as originally planned.

New Orleans District

At the **New Orleans** letting September 22nd very few contractors seemed interested in the 687,500 cubic yards of levees offered. On four items totaling approximately 560,000 cubic yards no bids at all were received. On only one item was there more than one bid. The Government Engineers will undertake the four projects on which no bids were received at estimated prices, running around 55 cents per cubic yard on the two largest items of 250,000 and 300,000 cubic yards and at about $1.50 on the two smaller items

[Time Economy for Making Wide Excavations]

Bucyrus-Monighan Walkers are made with booms as long as 200 feet—but the effective reach of the Bucyrus-Monighan Walking Dragline is far in excess of its reach.

After completing a section nearly as wide as its boom length, the Walker can zig-zag or back off laterally to the line of work, and finish an additional width of 50% or more . . . . the machine can always step off in any direction.

Walking traction saves time regardless of the task —which means that in use the Bucyrus-Monighan Walking Dragline is constantly saving money for the contractor. Bucyrus-Monighan Company, Chicago, Illinois.

Time Economy

1. In Inclement Weather Operation
2. On Soft or Wet Footing
3. When Changing Direction
4. For Time-Limit Contracts
5. Where Work Varies
6. When Maneuvering in Limited Space
7. For Making Wide Excavations
8. For Getting Around Obstructions
9. On Rough Footing

Bucyrus-Monighan Walker

BUCYRUS MONIGHAN

Walking Draglines 1 to 10 cubic yards

Sold by

BUCYRUS-ERIE CO.

South Milwaukee, Wisconsin

Representatives throughout the U. S. A. Branch Offices: Boston, New York, Philadelphia, Birmingham, Pittsburgh, Chicago, St. Louis, Kansas City, Dallas, San Francisco. Offices or Distributors throughout the world. B-41

For your convenience in writing to Bucyrus-Erie Company, you will find a card bound in this issue.

Shots From the Firing Line— *Continued*

of 3,500 and 6,000 cubic yards. The successful contractors who secured the rest of the work were: **Nil Desperandum, Incorporated,** of Delta, Louisiana, 12,000 cubic yards on the Bayou Vidal-Elkridge levee at 90 cents; **Ford, Bacon & Davis Construction Corporation** of New York City, 42,000 cubic yards on the Kempe-Lake St. John Levee at 38 cents; **Robinson & Young** of Baton Rouge, 70,000 cubic yards at 39.95; and **Jules A. Saunee,** New Orleans, the Wenck Villa and Alberti levees totaling 4,000 yards at 97.9 cents.

At the **New Orleans** bidding September 26th, 11,620,000 yards were offered on the Mississippi and Atchafalaya Rivers. Few bids were received and 1,730,000 yards in three sections went begging with no offers.

Successful bidders were: **Dameron & Kenyon, Incorporated,** of Port Allen, Louisiana, 915,000 yards on the Lottie-Ramah levee at 24 cents; **McWilliams Dredging Company** of New Orleans, 1,320,000 yards on Bayou Sorrel-Long levee at 45 cents; **Hardwick & Horton** of Lobdell, Louisiana, 440,000 yards at Marengo Bend at 21.11 cents; **Lower Coast Construction Company** of New Orleans, 920,000 yards at Ormond, Southport, English Turn, St. Thomas Church and Lucky Hit levees at 27.74 cents.

New Orleans will readvertise the following: 3,100,000 yards on the Hamburg-Palmetto levee and 550,000 yards on Petite-Krotz Spring levee. The U. S. Engineers estimate the latter should go for 22.19 cents and the Hamburg-Palmetto sections from 25.80 to 29.51 cents.

Because the Atchafalaya Levee Board was unable to provide the right-of-way for the Hamburg to Palmette levee, the Lewis-Chambers Construction Company lost 4,375,000 cubic yards on which they were low bidders. **The work will be re-advertised** as soon as the right-of-way difficulties can be cleared up.

Rock Island District

At the letting held at Rock Island September 29th, Major Wheeler recommended award to **S. A. Healy Company** of Davenport, Iowa, on Dam No. 20, one mile above Canton, Missouri. The bidding was very close with the above-named company low with $2,194,577.

At the **Rock Island** bidding October 3rd **Pennsylvania Drilling Company** of Pittsburgh, Pennsylvania, was low on the test borings for locks 11 and 12. On Lock 11 their unit bids were $2.60 per foot on 570 feet of overburden drilling and $4.00 per foot on 30 feet of rock. On Lock 12 they bid $2.20 per foot on 750 feet of overburden and $4.50 per foot on 30 feet of rock. If awarded both jobs they offered a discount from these prices of 30 cents per foot.

The bidding October 10th shows **Al Johnson Construction Company** of Minneapolis as low bidder on the channel excavation in the Mississippi River near Horse Island and Linwood, Iowa. This Minneapolis concern bid $3.23 per yard, for a total of $355,300. They propose to handle the excavation by the wet method. S. A. Healy Company of Davenport, Iowa planned on handling the work in the dry their bid being $4.13 per yard which was third low.

At the same bidding low bidder for excavating and disposing of material at Lock 20 consisting of 125,500 cubic yards of rock excavation and 26,000 cubic yards of common, was the **Mason Construction Company** of Dayton, Ohio. They bid $1.98 for the rock and .35 for the dirt, a total of $257,590.

Major Wheeler of the U. S. Engineers Office at Rock Island, Illinois, announces that **bids will be opened about November 7th for the construction of Lock No. 21** on the Mississippi River located approximately 2 miles down stream from Quincy, Illinois. The dimensions of the main lock are 600 feet long by 110 feet wide and the auxiliary lock 380 feet long by 110 feet wide. The length of each of the guide walls is 600 feet. The main overall length of the main lock and guide walls is 1,940 feet. The work includes 938 lineal feet of cofferdam, 300,000 cubic yards of common excavation, 80,000 cubic yards of fill, 7,800 cubic yards of protection stone, 96,860 square feet of steel sheet piling, 214,000 lineal feet of timber piles, 73,400 cubic yards of concrete and various timbering and machinery installation. Plans and specifications may be inspected at the U. S. Engineers Offices at St. Louis, St. Paul and Rock Island.

Clarke, Kearney & Stark of Chester, Illinois, bid 45 cents per cubic yard for 16,700 cubic yards in the Lower St. Francis Levee District.

Arkansas Notes

By ERNEST W. FAIR

J. R. Rhyne, State Highway Director, and **W. W. Zass,** State Highway Engineer attended the annual meeting of the American Association of Highway Officials at Milwaukee.

The Dalton Construction Company has finished road work near Brinkley.

The support of the Little Rock chamber of commerce has been asked to obtain a public works grant for **a canal connecting Little Rock with the White River.** Wallace Townsend, president of the chamber, is backing the movement.

Construction work has been begun on **a large lake project** 15 miles west of Gentry and 2 miles southwest of Colcord in Delaware county, Oklahoma. A large dam is to be placed across Cloud creek at this location.

J. M. Page, senior engineer of the United States Bureau of Public Roads spoke before a recent meeting of the Little Rock Real Estate board.

The Garrett Construction Company of Springfield, Mo. has begun work on a contract on highway No. 65 south of Leslie.

Oklahoma Notes

By ERNEST W. FAIR

A dam is being planned on the Salt Fork of the Red River in Greer County near Mangum.

Homer H. Dunlap, Sr., Helen R. Dunlap and Homer H. Dunlap, Jr., are incorporators of the **M. and F. W. Contracting Company** of Oklahoma City, which is to have a capital stock of $10,000.

S. O. Maxey and Company of Durant are completing a $154,827 road job in Carter County on U. S. Highway No. 70 from Lone Grove west.

The Keliher Construction Company of Dallas, Texas, is building a $154,969 bridge on state highway number 34 over the Salt Fork of the Red River south of Mangum.

The Park-Ward Company of Oklahoma City is doing $71,086 of highway construction work in Kiowa County on state highway number 14.

The Hyde Construction Co. of Enid has finished two sections of work at $137,338 in Major County and $33,326 on highway 64 in Sequoyah County.

T. C. Ottinger of Hinton has finished concrete pipe culvert work on U. S. Highway 270 in Pittsburg County.

M. E. Gillioz of Monnett, Missouri, has completed a $72,972 road job in Woods County. **The Kadane Construction Company** has begun work on a $30,000 bridge in the same county.

S. E. Gray of Muskogee has been awarded the contract to build a low water bridge near Wilburton on highway 270.

Work is to be begun immediately on an Arkansas River levee project between Sand Springs and Tulsa which will employ more than 500 men for a year and cost approximately $760,000. The project comprises 16 miles of levee 40 feet wide at the top with a 30-foot roadway and extending six feet above high water marks.

Construction of a 300-acre lake 18 miles southwest of Perry in Garland County by the Shell Petroleum Company has been begun. It will furnish an adequate water supply for development of adjacent oil fields.

Jones and Brooks of Oklahoma City have finished grading and drainage on U. S. Highway No. 72 in McIntosh County north of Eufala and south of Checotah. They have also completed a 1.6-mile job in Woodward county and 5 miles in Harper County.

The B and M Construction Company of Oklahoma City has built four bridges on U. S. Highway 277 in Comanche on a contract of $36,965.

Pharoah and Company, Inc., of Henryetta have finished seven miles of grading, drainage and bridges on U. S. Highway No. 70 in Choctaw County; also five miles of grading and drainage in Woodward County, as well as the same in Harper County.

The Laws Construction Company of Oklahoma City has been granted a charter for $3,000 in capital stock.

Louisiana Notes

By ERNEST W. FAIR

Members of the Louisiana Engineering Society recently made an inspection trip to the Public Belt Commission-Louisiana Highway Commission Mississippi River bridge near New Orleans. More than one hundred members attended. Colonel Arthur M. Shaw, recently employed as a consulting engineer by the Chinese Government, addressed the meeting, speaking on "Engineering in China; Some Modern and Some Not So Modern."

The New Orleans Coal and Bisso Towboat Company has been awarded the contract to dredge the anchorage basin at Gulfport, Miss., at $55,000. The basin, one-fourth mile wide and one-half mile long, will be dredged to 16 feet with two feet additional overdepth, for which the company will be paid extra.

At a recent meeting of the Louisiana Engineering Society **J. H. Levy, resident engineer for Siems-Helmers, Inc.,** explained the construction methods being used on the $13,000,000 bridge across the Mississippi River near New Orleans, how the various spans were sunk and the sand island method used to erect the bridge piers. The method consisted of sinking huge steel caissons in the river, filling these to the water's level with sand and sinking concrete piers inside of the caissons as the sand is removed from the center.

Texas Notes

By ERNEST W. FAIR

Eugenia Walsh, E. L. Galbraith and J. G. Burney have been granted a charter for $15,000 capital stock as the **Walsh and Burney Construction Company** of San Antonio.

The Atlantic, Gulf and Pacific Dredging Company of New York City has been granted the contract for dredging approximately 9,100,000 cubic yards of material from the bat section of the Houston ship channel, so as to deepen the waterway to 34 feet over a bottom width of 400 feet. The bid was $704,300.

W. A. Kelse and Company of Galveston have been awarded a contract for the rubble mound dike at Texas City on a bid of $129,052. They are also building a sheet pile and stone dike to protect the entrance of the intracoastal canal at Port Bolivar. The contract was for $56,644.

Construction of **a causeway across Lake Sabine** near Port Arthur at a cost of $2,500,000 is being planned.

H. R. F. Helland of San Antonio and **B. E. Giesecke** of Austin have been added to the State Public Works Engineers staff.

Problems now confronting drilling contractors in the coastal area were discussed at a meeting of the Texas-Louisiana-New Mexico Drilling Contractors' Association held here recently. C. L. Delaney of Dallas, president, presided.

A $20,000 bridge over the Brazos at Richmond is being planned.

Butler Brothers of Cleburne are working on a Dallas highway project.

By GEO. A. CARLSON

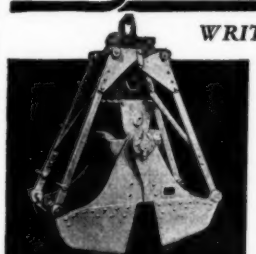
W. E. Callahan Construction Company of Dallas and St. Louis have started work on their $2,800,000 jetty job at Port Isabel, Texas. S. E. McCollough is Superintendent under Vice President W. K. McIlyar. Dodds and Wedegartner of San Benito are driving the pile for the 2½ miles of trestle work. Servtex Materials Company of New Braunfels, Texas are furnishing core stone and the heavy stones are coming from the granite quarries around Marble Falls, Texas. Bucyrus-Erie patented "Rock Grabs" are expected to show quite a saving in the several handlings of the 480,000 tons of stone required on this work.

Superintendent W. E. Orr of Lee Moor Contracting Company of El Paso has started construction of the Salt River Bridge on the Globe-Showlow Highway in Arizona. Bill left nearly all of his equipment on the River after completing the enormous grading job which was described in the January issue of **Excavating Engineer.**

Commissioner Lawson of the International Boundary Commission last month placed **Engineer J. C. Lytle** in charge of the rehabilitation of the Hidalgo and Cameron Counties Flood Control system in the Lower Rio Grande Valley. Col. S. F. Creselius

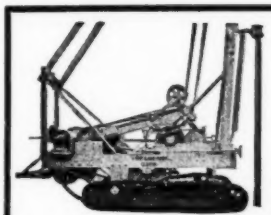
Hayward Buckets

WRITE FOR BULLETIN 654



It gives interesting operating and construction details about the Hayward Class "K", a digging Clam Shell Bucket that is built for such hard service as digging through surface soil and clay, for excavating loam, sand and shale and for sewer work.

THE HAYWARD COMPANY
52-54 Church St., New York, N. Y.



Reduces Costs . . . Increases Footage

Owners of Loomis Full Length Crawler Mounted "Clipper" drills report great satisfaction in their work in reducing costs and increasing footage.

Size 44 "Clipper" comes equipped with steel frame; steel or wooden mast, wire or manila line.

WRITE FOR FULL INFORMATION
Established 1842
THE LOOMIS MACHINE CO., K STREET TIFFIN, OHIO

The Bargain of the Year

ONE COMPLETE NARROW GAUGE DIRT MOVING OUTFIT including shovel, camps, shop and haulage equipment. Located near Fort Wayne, Indiana. Can you use it?

54 Steel bunks with mattresses and bedding. Mattresses and bedding are sewed up in burlap.
6 Heating stoves.
50 Shovels and picks, approximate.
5 Wagons and boxes. Light wagons about 2¾ axles.
1 Fairbanks Morse gasoline engine and 5x5 bulldozer pump 3 HP.
2 Fairbanks Morse gasoline engine and 3x5 bulldozer pump 1½ HP.
4 Track jacks, 15 ton.
3 Track jacks light.
1 Duplex Pump—Worthington, 5¼x3½x5.
10 Slips.
1 Anvil.
1 Forge.
6 Switches.
4 Frogs.
10 Switch points.
2 Wheelbarrows.
2 Each, scythes, hand saws, cant hooks, spike malls.
1 Carbide light.
1 Kitchen outfit.
1 Set boiler tubes for steam shovel.
30 Western dump cars, 5-yard.
2 Davenport locomotives, No. 2039 and No. 2040, weight about 20 tons.
1 Bucyrus 50-B Steam Shovel No. 4368.
1 36x84" vertical boiler.
1 6" centrifugal pump with upright engine attached.
2 Galvanized water tanks, wagon size.
100 Timbers, 10x12x16'.
12 Timbers 10x12x32'.
1 Chevrolet touring car, 1924 model.
1 Ford 1-ton truck.
1 Best Caterpillar tractor (30).
About 800 pieces of pipe, size 1½ and 2", random lengths.

Will consider individual sale of separate items.

ADDRESS BOX 449 ME.
EXCAVATING ENGINEER SO. MILWAUKEE, WIS.

Shots From the Firing Line— *Continued*

has returned to El Paso to assist C. M. Ainsworth on the larger Rio Grande project at El Paso. On September 13th the final ratification between the United States and Mexico assured completion of the Rio Grande work—a fine tribute to Commissioner Lawson who proposed the scheme of river straightening, worked out all of the details, and will now see his plan carried out. Sr. Armando Santacruez is the International Boundary Commissioner for Mexico.

L. E. Whitham and Capt. H. F. McFarland are in hopes of working into November on their gold placer lease at Placerville, Idaho which is working out so well that, especially now with the increased gold prices, they wish the deposit were in Texas so that they could work all winter.

Operator Kingsley is shown above handling **Hunter T. Farrell's new 52-B** Bucyrus-Erie Diesel dragline. The 52-B equipped with 60′ boom and 2½ cu. yd. Bucyrus-Erie Type "X" drag bucket is opening up a new gravel deposit at Farrell on the Rock Island Railroad just back of W. T. Waggoner's "Arlington Downs" Race Track between Dallas and Fort Worth where Texas' first legalized race meet is now in progress.

Southwest Construction Materials Company, East Texas Sand and Gravel Company, and Gifford-Hill and Company, Inc. now sell their sand and gravel exclusively through the **North Texas Materials Sales Company**, Dallas which Howard Parks is directing.

Pure Oil Company has its Bucyrus-Erie Type "1025" and GA-2 draglines working four 6-hour shifts daily building a 35 acre salt water reservoir just north of their large Van, Texas field.

Russ Mitchell, Inc. of Houston subbid his Bexar County heavy rock highway work to **Briggs and Darby**, a subsidiary of R. W. Briggs and Company. Bob Briggs, President, recently acquired two Bucyrus-Erie D-2 Diesel machines to supplement his other excavating equipment.

While returning from one of the Texas State Highway Lettings **John Lane**, Superintendent for Barker Brothers on their Mississippi River levee work at Lula, Mississippi, was **run down by an auto** while in Memphis. Although John was severely bruised he is back on the job again. Operators Tom Barker, Joe Lane and Ray McMillan, and the rest of Charles Barker's organization have been making some splendid performance records with their Bucyrus-Erie 37-B and 43-B draglines.

There were two State Highway Lettings last month on October 16th and October 23rd. **Prices are still not as high as they should be**, but by the end of this month a number of the Texas Public Works projects will be awarded which should lessen the competition at Austin.

Vernon Sullivan at El Paso, Engineer for the Red Bluff Water Improvement District, received approval and loan of **$2,600,000 for the dam, power house, and irrigation development** which will be constructed about 40 miles north of Pecos, Texas. This is one of the bigger jobs that should get under way this month.

Kansas Notes

By ERNEST W. FAIR

A flood control conference of representatives of five Missouri and Kansas cities was held in Kansas City recently. Representatives of Kansas City, Mo., Kansas City, Kan., Lawrence, Kan., Topeka, Kan., and Manhattan, Kan. attended the meeting.

The Kansas state Forestry, Fish and Game commission has **approved five lake projects** for the state as follows: Wabaunsee county, 240 acres; Finney county, 320 acres, Crawford county, 454 acres, Geary county, 100 acres and Franklin county, 35 acres.

Projects now being planned: Antony—a municipal power plant to cost $57,496; Lawrence — extension of water mains to cost $17,035; Savetha —sewage disposal plant to cost $57,496; Kansas City—extension and betterments to water main system to cost $112,160 and underground connections from power plants to sub stations to cost $608,000; Lawrence—street repair work $47,484; Pratt county—road work $8,114.50; Johnson county — bridge $4,500; Kearney county—new court house $80,000; Greenlead—new school $20,000; Bonner Springs—new schools $75,000; Jefferson county—roads and bridges, approximately $170,000; Manhattan—new field house for stadium $250,000.

Colorado Notes

By H. M. BIBAUD

Two special improvement districts are to be organized as speedily as possible to put through the **Cherry Creek flood control project**, Mayor Begole of Denver announced after a conference with City Attorney James D. Perricott, Manager Walter B. Lowry of the Department of Improvements and Parks, and City Engineer A. K. Vickery. Total cost of the flood control project is estimated at $1,500,000. A conservancy district is to be organized by Araphoe and Douglas counties and is expected to provide $210,000. The Public Works Administration will be called upon to assist with funds. The tentative plan calls for the construction of a dam both to regulate the stream flow to fit the carrying capacity of the channel and to stop the flow of the creek from cutting a new channel.

L. Leone of Trinidad was low bidder on a state highway project for 3.5 miles of gravel surfacing south of Durango. His bid was $56,555.

Monaghan and Horter, highway contractors, have been announced as the lowest bidders on the four miles of gravel surfacing to be done by the State Highway Department near Maybell, Colorado. Their offer was $68,416.

Improvements to cost $58,000 are under way in Mesa Verde National Park under direction of C. Marshall Finnan, Superintendent. New trails are being built and roads are being repaired and extended at a cost of $40,000. A mile and a half of subsidiary camp roads will also be finished.

Application was made to the Public Works Fund, by George M. Ball, Public Works Engineer for Colorado, for **$3,500,000 for completion of the Moffatt tunnel water diversion** program. Detailed plans for the Moffatt project which accompanied the application contemplate the diversion of 54,600 acre feet of water per year through a system of dams, ditches, pipe lines and tunnels from the Fraser river and tributaries in Grand county. The construction of a 6-mile canal from South Boulder creek toward Denver at a cost of nearly one million dollars is a notable feature of the project.

Colorado, Nebraska and Wyoming, according to M. C. Hinderlider, State Engineer, have reached a possible solution of the **Casper-Alcova water problem** for diversion of water from the North Platte River. Colorado's plan for "moving the water up the river" where a reservoir would be built at Torrington, Wyoming, is the plan seemingly favored at present by the three states concerned. By transmountain diversion through the North Platte and Laramie rivers into the Poudre River this would furnish water for use in the Fort Collins and Greeley districts as Colorado's share in the undertaking.

The water diversion tunnel through the backbone of the continental divide from Grizzly gulch on the west to Twin Lakes on the east is creating much interest. The tunnel will underlie the old ghost mining town of Independence, the scene of much mining activity in early days. The contract is held by the **Platt Rogers Company** of Pueblo. The diversion will be made from Grizzly Creek, Lincoln Creek and Roaring Fork. The water diversion tunnel will be 3.3 miles long. The underground work will be started at once. The water will be used for irrigation in the lower Arkansas Valley.

Governor Johnson, Attorney General

Prosser and State Engineer Hinderlider have filed a request with the administrator of public works in Washington for the sum of **$347,000 for the construction of a 100-foot dam** to create a body of water to be known as the La Plata river reservoir No. 1. The reservoir, which will be located south of Redmesa just north of the Colorado-New Mexico state line is calculated to impound 8,000 acre feet of water for irrigation and flood control purposes. **There is also under consideration,** a plan to request the amount of approximately $300,000 for the construction of a reservoir at Long Hollow for irrigating 12,000 acres of land on the east and south portions of Fort Lewis mesa.

Detailed plans for **$7,000,000 worth of water regulatory projects** in the San Luis valley were presented in Washington the second week in October to Public Works officials by state Senator Elmer Headlee of Monte Vista, representing Alamosa, Sagueche and Rio Grande counties. The projects for which the funds are asked are the State Line Reservoir, the San Luis Valley Drainage Canal and the Vega-Sylvester Reservoir above Creede.

Wyoming Notes

By PAUL G. FRIGGENS

Low bidders on seven state highway projects involving an expenditure of approximately $217,000 were awarded contracts this month.

Earl Vandehel of Cheyenne was low bidder on grading, base course surfacing and draining of the road from the Veterans hospital to the Cheyenne city limits. His bid was $2,342.

Construction of sidewalk and bridge on .86 of a mile of the Torrington-Cheyenne road in Goshen County: **Northwestern Engineering Company,** Rapid City, $7,496 for grading, and **Lyall Landreth,** Scottsbluff, $10,132 on bridge work.

Construction of bituminous macadam pavement with storm sewer and bridge over an irrigation canal on 1.084 miles of state highway No. 185 through Wheatland: **S. Schwartz,** Colorado Springs, $10,162 on sewer work; **Goodrich and Mathison,** Wheatland, $5,410 on bridge work, and **A. H. Read,** Cheyenne, $33,068 on paving.

Construction of a storm sewer and bituminous macadam pavement and miscellaneous work on South Second Street, North Third Street and Grand Avenue, in Laramie: **J. S. Schwartz,** $35,894 on sewer work, and **Central States Construction Company,** Oakland, Cal., $74,443 on paving.

Construction of a 50-foot span over Tough Creek on the Thermopolis-Shonshoni road in Fremont County: **J. E. Crumm,** Casper, $7,035.

Grading and draining of 5.777 miles on the Douglas-Gillette road in Converse County: **Blanchard Bros.,** Denver, $25,191.

Utah Notes

Contract for roadwork on the East Rim Road and the south entrance to Zion National Park was awarded to **W. W. Clyde and Company** of Springfield for $142,254.

New Mexico Notes

At the October 6th letting of the New Mexico Highway Department at Santa Fe, the following were low bidders: **J. H. Miller & Company** of Denver, Colorado with $159,046 was low on project NRFLHP 2-B and also on project NRH 78 at $34,781 and project NRM 157-A Revised at $50,842; **S. H. Veater** of Arrey, New Mexico was low on project NRH 107-A and NRM 107-F at $52,143; **Driscoll Construction Company** of Pueblo, Colorado were low on project NRH 131-B at $61,886; **Davies & Sons** of Ft. Sumner, New Mexico were low on NRH 157-A & NRM 157-A at $54,630.

Arizona Notes

By H. M. BIBAUD

Road projects under contract in Arizona, October 1st, and those for which bids have been called will provide **work for 1,200 men** according to a statement issued by Thomas S. O'Connell, State Engineer. The projects will aggregate more than twice the amount of work in the same period last year.

Do You Need a "Longer Reach"?

Among the modern ideas for making wider use of the digging power and economy of the Sauerman "Crescent" Scraper is the scheme of hooking up this remarkable bucket with a revolving dragline to convert the boom machine into a long range excavator.

A booklet has been published illustrating and describing how the reach of any boom machine can be extended several hundred feet.

Ask for Bulletin 140.

SAUERMAN BROS., Inc.
474 S. Clinton Street, Chicago

Building a 40 Foot Fill

Raising this 40 foot fill on a railroad construction job, without the use of jacks—or the building of a trestle, is just one of the many instances where the Track Machine has been used at a great saving in time and labor. Disposing of overburden at quarries and mines, or any similar job where a track gang is maintained for shifting and raising, this machine and a few men will do the job quickly and soon pay for itself out of expense ordinarily required for men working with bars and jacks.

NORDBERG MFG. CO., Milwaukee, Wis.

THE NORDBERG PATENTED TRACK SHIFTER

Turn to Excavating Engineer
For Sale and Bargain Counter sections
for the
Largest List
of used equipment
Appearing in any trade paper in the field

Shots From the Firing Line— *Continued*

Four of the 23 projects are under construction and cost some $397,200. Twelve totaling $1,316,000 have been contracted and work will begin soon. Bids have been called for three more to cost $200,000. Four projects are waiting approval of the Bureau of Public Roads. Their costs will total $650,000. In addition to these, projects carried over from the past fiscal year will cost $350,000. These all furnish a grand total of $2,923,200.

When bids for construction of bridges and over-pass on the Petrified Forest-National Monument Highway in Apache and Navajo Counties were opened by the U. S. Bureau of Public Roads, the $37,202 bid of **Whiting Brothers**, St. John, for construction of two bridges and the $15,367 bid of the **Webb Construction Company**, Phoenix, for construction of the over-pass, were recommended for acceptance.

Construction work on the new Bush short-route highway to Payson was **resumed** early in October after a suspension of activities for several weeks due to reorganization under the R. F. C., through which labor was furnished. About 24 miles of the new highway was built last spring leaving 12 miles of new construction to be finished. The Bush highway will bring the forest recreational area of the Pine-Payson district 24 miles closer to Phoenix and will benefit the mining and stock interests of that district.

The low bid of $98,553 for construction of a bridge over the Salt river 43 miles northeast of Globe on the Globe-Showlow sector of Highway 60 was made by the **Lee Moor Construction Company** of El Paso, Texas. The contract calls for erection of a steel arch bridge with approach spans and the grading and draining of one-half mile of roads adjacent to the bridge. The work is an important link in the building of the east end of U. S. 60.

Contracts for road construction in northern Arizona **aggregating $596,255** were awarded September 25th by the state highway commission, the start of the 1933-'34 road program, made possible largely through federal allocations. The largest contract awarded on that date was for the improvement of 18.7 miles of the Flagstaff Fredonia highway, starting 9 miles southwest of the Grand Canyon Bridge. The award went to **Hodgman and MacVicar** and **Packard and Tanner** who submitted a joint low bid of $206,851.

The next largest award went to the **New Mexico Construction Company** for oiling 15 miles of the Flagstaff-Williams highway, west of Flagstaff. The company's bid was for $128,641. Other awards were: **All-Arizona Construction and Engineering Company**, construction of an overpass on Flagstaff-Williams highway five miles west of Flagstaff, bid $40,467; **Pearson and Dickerson** and **Roger Brothers**, improvement of 3.3 miles of Holbrook Lupton highway, starting 8 miles east of Holbrook, $23,587. **Hodgman and MacVicar**, improvement of 8.7 miles of Flagstaff-Fredonia highway starting six miles east of Flagstaff. **Orr and Rawls** and **L. C. Lashmet** bid low at $88,990 for the grading and draining and the oiling of 2.1 miles of road 86 miles south of Tombstone. The contract includes bridge structures over 20-foot clear span.

Haddock and Lindbergh, Pasadena, California were low at $42,447 for construction of a three-mile section of the Oak Creek National Forest Highway, in Coconino County near Flagstaff.

H. J. Hagen of Globe was low bidder at $127,500 for grading 6.87 miles of the Strawberry Hill section of the Pine-Winslow national forest highway in Gila and Coconino counties.

The Phoenix-Tempe Stone Company of Phoenix and **C. B. Hallenbeck**, Denver submitted the lowest bid for the construction work on U. S. 80, between Benson and Vail. Contracts will be awarded October 16th.

Bids will be received and opened October 31st for the construction of two road projects, one on U. S. Highway 66 between Ashfork and Kingman. The other is on U. S. Highway 80 between Benson and Douglass.

Nevada Notes

Wheelwright Construction Company of Ogden, Utah with a bid of $89,886 was awarded the contract for reconstructing that portion of the state highway system in Lander County, between 12 miles and 27 miles east of Austin.

N. M. Ball of Berkeley bid $91,317 and was awarded the contract for reconstructing that portion of the state highway system in Lander and Eureka Counties between 27 miles east of Austin and 14 miles west of Hay Ranch.

Dodge Construction Company, Incorporated, of Fallon, was awarded the contract for constructing that portion of the state highway system in Nye County, between 33 miles and 22 miles south of Beatty. Their bid was $43,068.

Union Paving Company of San Francisco was awarded the contract for reconstructing state highway in Lyon and Churchill Counties between 2 miles west of Lahontan and Leeteville. The bid was $68,286.

N. M. Ball of Berkeley with a bid of $88,124 was awarded the contract for reconstructing state highway in Lincoln County, between Pioche and Stonehouse.

San Francisco and Vicinity

By H. L. LIVINGSTON

A large number of highway jobs have been awarded in California within the last two weeks putting a large amount of idle equipment back to work. The following jobs will be of interest.

Granfield, Farrar & Carlin, San Francisco, were awarded contract for 10.3 miles of grading between Carquinez Bridge and Cordelia. This contract involves 1,166,000 cu. yds. of roadway excavation. Five shovels will be placed on this job and worked on a double-shift basis, each shift consisting of six hours.

Mittry Bros. Construction Company of Los Angeles who bid $222,611.00 has been awarded contract for grading in the Sequoia National Forest in Tulare County. This work involves 196,300 cubic yards of excavation.

The Union Paving Company of San Francisco has been awarded the contract for .8 of a mile grading between one mile north of Inspiration Point and Inspiration in Santa Cruz County. This work involves 250,500 cu. yds. of roadway excavation.

Fredrickson & Watson of Oakland, California, have been awarded contract for 9.1 miles grading and surfacing in Shasta County. This work involves 275,500 cu. yds. of roadway excavation; 31,100 tons of crusher run base and 17,000 tons of crushed gravel.

U. S. Engineers Office at Portland, Oregon has awarded a contract to **Guy F. Atkinson Company** of San Francisco and **Winston Bros.** of Minneapolis in the amount of $1,111,945 for constructing a jetty on the Columbia River.

A contract in the amount of $1,520,000 has been awarded to the **Rohl-Connelly Company** of Los Angeles for constructing a 4,000 ft. rubble-type breakwater at the Los Angeles-Long Beach outer harbor.

Bids will be called early in 1934 by the U. S. Bureau of Public Roads for grading a section of the Wawona Glacier Point Highway in Yosemite National Park for a distance of approximately five miles. The estimated cost of this work will be $250,000. Weather conditions make it impossible to work in this country during the winter months.

A contract has been awarded to the **Youdall Construction Company and Chas. Harlowe, Jr.**, San Francisco, in the amount of $678,799 for 9.5 miles of grading and surfacing in Del Norte County. This job involves 670,500 cu. yds. of roadway excavation.

Mittry Bros. Construction Company of Los Angeles, who bid $334,206 to the California Division of Highways, has been awarded the contract for 7.6 miles of grading and screened gravel surfacing in Humboldt County. This contract involves 715,000 cu. yds. of roadway excavation. Mittry Bros. have just completed a large contract in Santa Cruz County and are moving two shovels from this job to their new contract, one shovel being a Bucyrus-Erie Model 50-B Diesel and the other a Koehring Diesel shovel.

Guy F. Atkinson Company, San Francisco, has been awarded contract by the U. S. Engineer's office in the amount of $196,652 for a 400-foot extension to the present breakwater at Monterey, California.

Oregon Notes

Contract for grading the road around the rim of Crater Lake National Park involving $228,533 was awarded to **Dunn and Baker** of Klamath Falls.

Not in the Contract

Buddy was up before the disability board. The pompous alienist was asking him a long string of questions to determine his mental condition and Buddy was rapidly getting disgusted.

"Quick," shouted the celebrated doctor, "Tell me this: How many legs has a lobster?"

Buddy looked at him crushingly before replying.

"For the luvva Mike," he said. "Is that all you got to worry about?"

"It's good that dogs don't drink beer."

"Why?"

"Can wires stay up without telegraph poles?"

Plumber (arriving late): How is it?

Happy Husband: Not so bad. While we were waiting for you to arrive, I taught my wife how to swim.

Mother: "What made you stay so late with that shovel operator? Have you a flat tire?"

Daughter, dreamily: "No, Mother, I'd hardly call him that!"

A colored employee of an express company approached his superior with the query:

"Boss, what we gwine do 'bout dat billy goat? He's done et up where he's gwine."

Mary: "I saw a man kissing you at the back door last night. Was it the postman or the policeman?"

Maid: "Was it before seven o'clock or after?"

"Rastus, I see your mule has 'U.S.' branded on his hindquarters. Was he in the army?"

"No, boss, dat 'U.S.' don't stand for Uncle Sam, it means Unsafe."

The prosecuting attorney encountered a rather difficult witness. Exasperated by the man's evasive answers he asked him if he was acquainted with any of the jury.

"Yes, sir, more than half of them."

"Are you willing to swear that you know more than half of them?" demanded the attorney.

"If it comes to that," he replied, "I am willing to swear that I know more than all of them put together."

A shovel runner and his latest girl friend were out for a ride one evening. They turned off on a tree-bordered country road and the following conversation was overheard by a hitch hiker camped in the bush.

"Oh John, let's don't park here."

" " " " "

" " " "

" " "

" "

"

Shovel Mechanic—When is the next bus out of this burg?

Officer—Three o'clock, sir.

Traveler—What! Isn't there one before that?

Officer—No, sir. We never run one before the next.

Gladys—Are you going to get a divorce, dearie?

Myra—I don't see how we can. We haven't got our engagement paid for yet.

"How does your cousin like working in the bank?"

"She just adores it—says it's simply wonderful to find out how little money some of her friends have."

WILLIAMS Takes Less Crane Time Per Job!

You get an unusually fast and economical digging service of remarkable duration—when you buy a Williams "Champion" bucket. *Write for descriptive bulletin.*

THE WELLMAN ENGINEERING CO.
7002 Central Ave.
CLEVELAND, OHIO

Ebonite **Brake Lining, Brake Blocks and Clutch Facings . . .**

. . . cut operating costs on shovels, cranes, draglines, hoists, tractors and trucks . . . multiply operating hours between re-lines . . . cut time losses for brake adjustments.

L. J. Miley Company, Inc. 1457 S. Michigan Ave., Chicago, U. S. A.

MEETING PLACE OF CAPITAL AND LABOR

THE KOENIG LABOR AGENCIES

Established 1875

ST. LOUIS
612 Walnut Street
Main 2766 and 2767

KANSAS CITY
501 Delaware Street
Main 0796

HELP OF ALL KINDS FURNISHED FREE

EXCAVATING ENGINEER Bargain Counter

★ ★ ★ THE ITEMS LISTED on these pages have been selected because they offer unusual values to the man who is looking for a bargain. Some of this equipment is surplus stock which has never been used, some is rebuilt and carries new equipment guarantee, some is just plain used. But every item is priced for quick sale. If any of this equipment fits your needs send a postcard or letter, mentioning the reference number, to *Bargain Counter, Excavating Engineer, South Milwaukee, Wisconsin.* We'll pass your inquiry along to the owner and you will receive price and complete information promptly. Act now — with advancing prices on new stock this equipment will move fast.

SHOVELS-CRANES DRAGLINES

P&H MODEL 208—45′ BOOM DRAGLINE Cats—15½′ long, 9′ wide, 22″ Treads. 100 HP. Waukesha High Alt. Engine. SCD-1.

AMERICAN 1 CU. YD. GASOLINE SHOVEL. Motor overhauled 1932. Good value. SCD-3.

P&H MODEL 600—40′ BOOM CLAMSHELL. Waukesha 75 HP. Engine. New 1929. Dragline and Shovel equipment also available. SCD-4.

ORTON ⅝ YD. GASOLINE SHOVEL. New 1928. Make an offer. SCD-5.

P&H MODEL 600. New 1929. 20′ Boom, 14′3″ Dipper Handle, 1 cu. yd. Dipper. Waukesha 75 HP. Engine. Dragline and Clam Shell Equipment also available. SCD-7.

BUCYRUS-ERIE MODEL 30-B DIESEL—25′9″ Boom, 14′ Dipper Handle, 1 yd. Dipper. SCD-9.

BAY CITY TRACTOR TYPE—CHAIN CROWD —⅝ YD. SHOVEL. Cat Mounted. McCormick-Deering Power Unit. Excellent condition. SCD-10.

OSGOOD "CONQUEROR" GAS—1¼ CU. YD. SHOVEL—Brand New LeRoi Engine. SCD-18

MONIGHAN MODEL 1-W, WALKER — 60′ Boom Dragline, 1¼ cu. yd. Page Bucket. Good condition. SCD-13.

P&H MODEL 600—40′ BOOM DRAGLINE. Waukesha 75 HP. Engine. New 1929. Shovel and Clamshell Equipment also available. SCD-14.

BAY CITY TRACTOR TYPE CLAMSHELL. NEW 1928. Excellent condition. Shovel Equipment also available. SCD-15.

BUCYRUS-ERIE SLIGHTLY USED-LOAD-MASTER TRACTOR CRANE—14′ Boom—Rubber tired wheels—Rated lifting capacity 4500 lbs. McCormick-Deering Power Unit—New Machine Guarantee. SCD-17

COMPLETE FRONT END EQUIPMENT

Shovel Equipment

⅝ CU. YD. DIPPER—23′ BOOM—15′ DIPPER HANDLE—Extra High Lift Rope Crowd Shovel Equipment suitable for Models 1030 or 1035. **Brand New.** SE-2.

⅝ CU. YD. DIPPER—23′ BOOM and ENGINE —12′6″ DIPPER HANDLE—Shovel Equipment suitable for 20-B Steam. **Brand New.** SE-15.

⅝ CU. YD. DIPPER—26′ BOOM and ENGINE —17′ DIPPER HANDLE—High Lift Shovel Equipment suitable for 30-B Steam. **Brand New.** SE-16.

¾ CU. YD. DIPPER—25′9″ BOOM—14′ DIPPER HANDLE—Shovel Equipment suitable for 30-B Diesel. **Brand New.** SE-17.

⅞ CU. YD. DIPPER—23′ BOOM—15′ DIPPER HANDLE—High Lift Rope Crowd Shovel Equipment Complete suitable for Model 1030 or 1035. Rebuilt—New Equipment Guarantee. SE-22

⅞ CU. YD. DIPPER—21′9″ BOOM and ENGINE—15′ DIPPER HANDLE — High Lift Shovel Equipment. Suitable for 31-B Steam. **Brand New.** SE-18.

1 CU. YD. DIPPER—26′ BOOM—15′ DIPPER HANDLE—Rope Crowd Shovel Equipment suitable for Model D-2. **Brand New.** SE-3.

1¼ CU. YD. DIPPER—25′ BOOM—17′ DIPPER HANDLE—Slightly Used Rope Crowd High Lift Shovel Equipment suitable for Model 37-B. **New Machine Guarantee.** SE-5.

1½ CU. YD. DIPPER—23′6″ BOOM—15′ DIPPER HANDLE—Slightly Used Rope Crowd Shovel Equipment suitable for Model 37-B. **New Machine Guarantee.** SE-6.

1½ CU. YD. DIPPER—27′ BOOM—17′ DIPPER HANDLE—High Lift Rope Crowd Shovel Equipment suitable only for Bucyrus-Erie 43-B machines. Rebuilt—New Equipment Guarantee. SE-23.

Clamshell Equipment

40′ BOX BOOM CLAMSHELL EQUIPMENT INCLUDING ROPES. Suitable for Model D-2. **Brand New.** CS-3.

Dragline Equipment

35′ CHANNEL BOOM, FAIRLEAD AND ROPES but not including bucket. For use on Model D-2. DL-2.

40′ CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Model D-2. DL-3.

40′ BOX BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Model D-2. DL-4.

45′ BOX BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Model D-2. DL-5.

40′ CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model E-2. **Brand New.** DL-6.

45′ CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model E-2. **Brand New.** DL-7.

40′ CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model 30-B Diesel. **Brand New.** DL-8.

45′ CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For Model 30-B Diesel. **Brand New.** DL-9.

BRAND NEW Ropes included with each of above Dragline Equipments.

All of above equipment is BRAND NEW and of BUCYRUS-ERIE manufacture.

Trench Digging Equipment

¾ CU. YD.—36″ WIDE SOLID TYPE DIPPER, 21′ Boom, and all auxiliary equipment for application to **Model 1030.** Will dig to maximum depth of 18′. DS-3.

BRAND NEW PAGE, two dippers each ¾ cu. yd., one 38″ wide over cutters, the other 49½″ wide over cutters. 17′1½″ Boom and all necessary auxiliary equipment. Will fit Bucyrus-Erie 1030 or 1035. DS-7.

BRAND NEW Ropes included with each of above Trench Digging Equipments.

DIPPERS

Small Machines

2 ⅝ CU. YD.—Plate.—Will fit 20-B Steam or Gas. Brand New. D-12

1 2/3 CU. YD.—Plate front.—Will fit 14-B. Brand New. D-13

1 ¾ CU. YD.—Rock type.—Will fit 30-B Gas or Diesel. Brand New. D-14

1 ¾ CU. YD.—Rock Type.—Will fit 20-B Steam or Gas. Brand New. D-15

4 ¾ CU. YD.—Plate front.—Will fit 1030 or 1035. Brand New. D-16

1 ¾ CU. YD.—Cast Front Inserted Tooth. Will fit 1030 or 1035. Brand New. D-17

2 ⅞ CU. YD.—Plate front.—Will fit 1030 or 1035. Brand New. D-18

1 ⅞ CU. YD.—Plate Front. Will fit 18-B. Brand New. D-20

1 ⅞ CU. YD.—Rock type. Will fit 31-B. Brand New. D-21

1 1 CU. YD.—Rock type. Will fit D-2 or 31-B. Slightly Used. D-22

1 1¼ CU. YD. INSERTED TOOTH. Will fit GA-2 or GA-3. Slightly Used. D-25.

1 1¼ CU. YD.—Plate front. Will fit E-2, 41B or 42-B. Slightly Used. D-26

2 1¼ CU. YD.—PLATE FRONT. Will fit E-2. Brand New. D-27.

1 1⅜ CU. YD.—PLATE. Will fit E-2. Brand New. D-28.

2 1½ CU. YD.—Manganese Front Inserted Tooth. Will fit E-2, 41-B or 42-B. Slightly Used. D-29

1 1½ CU. YD.—Vanderhoef type with Vanderhoef teeth. Will fit E-2 or 42-B. Slightly Used. D-30

Large Machines

1 2½ CU. YD.—Front 2½" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Can be used on 68-C and 70-C Machines. **Brand New.** D-1.

2 3 CU. YD.—Front 2½" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Can be used on Model 100-B, 68-C, 70-C Machines. **Brand New.** D-2.

1 3½ CU. YD.—Front 2¾" Nickel Chrome Steel, two part Van Port Reversible Teeth. Can be used on Model 88-C, 95-C, Class 180. **Brand New.** D-3.

1 4 CU. YD.—Front 2¾" Molybdenum Cast Steel, two part Van Port Reversible Teeth. Has seen some service but in good condition. Can be used on Model 100-C, 120-B. D-4.

1 4½ CU. YD.—Lip 2½" Manganese Steel, two part Reversible Manganese Teeth. Can be used on Model 88-C, 110-C. **Brand New.** D-5

3 6 CU. YD. Molybdenum Steel Front, Annealed Cast Steel Back, two part Reversible Van Port Teeth. Can be used on 225-B and 320-B. **Brand New.** D-11.

1 8 CU. YD.—Front Molybdenum Steel, two part Van Port Reversible Teeth. Can be used on Model 320-B. **Slightly Used** but excellent condition. D-6.

DRAGLINE BUCKETS

1 1¾ CU. YD. OMAHA STANDARD. Rebuilt. Approximate weight 3,800 lbs. DB-7.

1 2 CU. YD. BUCYRUS-ERIE TYPE "U" RED ARCH. Rebuilt. Approximate weight 3,700 lbs. DB-6.

1 2 CU. YD. BUCYRUS-ERIE TYPE "U" RED ARCH. Rebuilt. Approximate weight 3,700 lbs. DB-8.

1 2½ CU. YD. BUCYRUS-ERIE INSERTED TOOTH. Rebuilt. Approximate weight 6,500 lbs. DB-9.

1 2½ CU. YD. OMAHA STANDARD. Rebuilt. Approximate weight 5,400 lbs. DB-10.

BOILERS

BRAND NEW

Will Make That Old Shovel Work Like New.

Can Also Be Used for Miscellaneous Service.

Vertical Type

9 36"x82½"—26 H.P.—142 lb. Working Pressure. Mass. Std. Will fit Type A. B-1.

4 42"x88"—35 H.P.—144 lb. Working Pressure. Mass. Std. Will fit Type B Shovel. B-2.

1 44½"x88½" fitted with extended fire box for burning wood. Can be used for coal or coke. 37 H.P.—144 lb. Working Pressure. ASME Std. Can be installed on Type B Shovel. B-3.

1 44½"x88½"—37 H.P.—145 lb. Working Pressure. Canadian Std. Will fit Type B Machine. B-4.

1 44½"x88½"—37 H. P.—147 lb. Working Pressure. Mass. Std. Will fit any Type B B-5.

1 46½"x88½"—37 H.P. 150 lb. Working Pressure. Special Wood Burning. Mass. Std. Will fit any B-2 or B-3 Machine. B-7.

2 46½"x88½"—37 H.P.—150 lb. Working Pressure. Mass. Std. Will fit B-2 or B-3 B-8.

3 46½"x110"—40 H.P.—155 lb. Working Pressure. Special Wood Burning Fire Box. ASME Std. Will fit any B-2 or B-3 B-9.

1 48"x7'10"—52 H.P.—150 lb. Working Pressure. Mass. Std. Will fit any 31-B B-10.

1 54"x100"—41 H.P.—125 lb. Working Pressure. ASME Std. Will fit B-2 or B-3. B-11.

2 58"x7'9"—70 H.P.—150 lb. Working Pressure. Mass. Std. Will fit 42-B Machine. B-12.

Locomotive Type

3 44"x17'—75 H.P.—125 lb. Working Pressure. ASME Std. Will fit Model 68-C. B-13.

1 44"x18'—88 H.P.—125 lb. Working Pressure. ASME Std. Will fit Model 70-C B-14.

1 54"x9'7"—70 H.P.—125 lb. Working Pressure. Canadian Std. Will fit Model 50-B Machine. B-15.

2 54"x11'3"—92 H.P.—125 lb. Working Pressure. ASME and Mass. Std. Will fit Model 50-B Machine. B-16.

1 54"x18'—127 H.P.—140 lb. Working Pressure. ASME Std. Will fit Model 103-C B-17.

ELECTRICAL EQUIPMENT

MOTOR—GENERAL ELECTRIC—3 phase, 25 cycle, 550 volt, 1500 RPM., 90 HP., BRAND NEW. EE-1.

50 KW MOTOR-GENERATOR SET—GENERAL ELECTRIC—consisting of 3 phase, 60 cycle, 440 volt, 1170 RPM., 75 HP., Induction Motor connected to 50 KW, 250 volt, 1200 RPM., Generator, including suitable rheostat and compensator. BRAND NEW. EE-2.

COMPENSATOR—GENERAL ELECTRIC—75 HP., 2200 volt, 3 phase, 25 cycle, manual type. BRAND NEW. EE-3.

TRANSFORMER—GENERAL ELECTRIC — 5. KVA. 2200-3810 volt primary, 440-220 volt secondary—3 phase, 60 cycle, with cast iron tank and cover, including specially fastened bushings to prevent oil leakage. BRAND NEW. EE-4.

GENERATOR — WESTINGHOUSE — 125 KW, 250 volts, 500 amperes. Direct Current. 440 RPM. Includes two outboard bearings. BRAND NEW. EE-5.

MOTORS (2) — GENERAL ELECTRIC — 21.5 H.P. 3 phase, 60 cycle, 440 volt, 900 RPM. Totally enclosed—ball bearing. BRAND NEW. EE-6.

LIGHTING PLANTS

1 1 KW MOON TURBO STEAM GENERATOR for Lighting Plant. 32 Volt. New. LP-1.

1 1 KW MOON TURBO STEAM GENERATOR for lighting Plant. 110 Volt. New. LP-2.

1 1 KW MOON TURBO STEAM GENERATOR for Lighting Plant. 110 Volt. Used. LP-3.

1 1½ KW MOON TURBO STEAM GENERATOR—110 Volt Light Plant. Slightly Used. LP-5.

AIR COMPRESSORS

2 11"x11"x12" STEAM DRIVEN LOCOMOTIVE TYPE, Westinghouse air compressors with fittings. Brand New. AC-1.

2 11"x11"x12" STEAM DRIVEN LOCOMOTIVE TYPE, Westinghouse air compressors with fittings. Used. Make offer. AC-2.

ENGINES

Designed especially for application to Excavating or similar Equipment. Can be used for stationary or semi-stationary service.

Diesel

4 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—4 cylinders, 7" bore x 8½" stroke, 75 HP at 600 RPM, 4 cycle, Vertical—valve in head type. Includes radiator, fan and air cleaners. DE-1.

2 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—5-cylinder, 9" bore x 10½" stroke, 150 HP at 450 RPM, 4 cycle, Vertical—valve in head type. Dust proof, Oil tight crank case and forced lubricating system. Full equipment. Also auxiliary air starting equipment. DE-2.

3 BRAND NEW NON-REVERSIBLE ATLAS DIESEL ENGINES—4-cylinder, 6" bore x 8" stroke, 60 HP. at 650 RPM. DE-6

Steam

1 12½"x16" link reversing type for Railroad Shovel. ME-1.

2 4½"x5" reversible—20.8 HP at 400 RPM. 100 lb. Pressure. ME-2.

1 4¾"x5" reversible—23.2 HP at 400 RPM. 100 lb. Pressure. ME-3.

2 5"x5" reversible—25.6 HP at 400 RPM. 100 lb. Pressure. ME-4.

1 "LITTLE TUGGER" INGERSOLL RAND STEAM HOIST ENGINE No. 1-H-5-2½ H.P. ME-5.

PUMPS

1 NB—3 STAGE CENTRIFUGAL PUMP—2" suction and discharge—bronze impeller and shaft—capacity 100 gallons per minute at 240' head operating at 1720 RPM or 270' head at 1780 RPM. Now equipped for belt drive but can be operated by 15 HP Electric Motor. ME-6.

Paint Rock, Mud and Headaches

(Continued from Page 447)

the partitions, are three covered steel boxes each holding the proper amount of cement for one batch. Each truck as it returns empty from the paver backs under the Butler bin where each of the three compartments is filled with the proper amount of sand and rock. Then it is driven under the Blaw-Knox bulk cement plant where the three steel boxes are filled with cement, and covered. Then the truck speeds down the grade to the paver. The number of trucks required to keep the paver busy naturally depends on the distance from the batching plant. At the time concreting was still a mile from the plant eight trucks were used.

When a truck gets to the paver, the dump body is raised and the tail gate tripped. This lets one batch of sand and stone into the skip of the paver. At the same time the steel box holding cement, which is located above the partition is pivoted so that the top is toward the rear of the truck. Then the cover is opened, and the cement also falls into the skip of the paver. Then the truck pulls ahead a dozen feet, the skip of the paver is raised, dumping the load into the hopper. Water is added and a cubic yard of concrete is ready in 1½ minutes. This is discharged into the bucket on the swinging arm of the paver, and run out and dumped ahead of the finishing machine. Meanwhile, the skip of the paver has been dropped to the ground and the truck has again backed onto the skip, and by tripping the partition just like a tail gate has discharged batch No. 2 into the skip. Same for batch No. 3. The truck high-tails it for the bins again.

760-feet of Paving in 10 Hours

The paver is a 27-E Multifoote operated by Charlie Scott, who doesn't waste a minute all day long, as is shown by the fact that on this job the Miller organization laid down an average of 760 feet of 7″x9″ paving 18 feet wide in a single 10 hour shift. Other concreting equipment includes a Lakewood finishing machine, a Fordson powered Austin 5-ton roller and a Caterpillar 15 motor patrol grader.

Finished grade ahead of the paver was made largely by hand, a dozen men being employed on this work. This highway job was done under the new Government requirements, employing considerably more than the customary amount of hand labor. These men were permitted to work 30 hours a week, and as the job was done in 10 hour shifts, the men worked six consecutive days, weather permitting, starting three days before the end of one week. They would then be laid off for a week. Thus two gangs were alternately employed to insure continuous progress of the job and to give the maximum number employment. This system worked out without inconveniencing the contractor, although "Monte" Lamonte, the bookkeeper, says it made plenty of extra work for him keeping track of two payrolls.

Superintendent Stanley Brenner, to whom we are principally

POSITIONS WANTED

Positions wanted advertisements will be run under this heading for 5 cents per word, minimum charge $1.00. Advertisements for help wanted free of charge.

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

SHOVEL OPERATOR

Three years' experience on Bucyrus-Erie Gas +Air on basement excavating, highway and street grading. Also eight years' experience on Erie, Marion, Bucyrus, steam shovels. Will go anywhere in U. S. A. or Canada. Can do own repairing. A-1 reference. Married. Present location Minnesota. Box 5801.

SUPERINTENDENT

20 years operating and in charge of heavy strip mine and quarry equipment. 45 years of age. Can furnish references from any former employer and the largest manufacturer of excavating equipment in America. Can take full charge on reasonable notice. Box 5901

EXPERIENCED DRAGLINE OPERATOR

Fifteen years experience on Bucyrus-Monighan, P&H, Northwest and other makes of Steam, Diesel, gas and electric draglines on levee work and phosphate mines. Hold three sets civil service papers with ratings of 70%, 85%, and 100%. Married but can go anywhere. Furnish excellent references. Present location, Louisiana. Box 5903

DRAGLINE OPERATOR

25 years experience on steam draglines on construction work. Prefer operating dragline. Can do own repair work. Reliable references furnished. Present location, Indiana. Box 5701.

SHOVEL OR DRAGLINE OPERATOR

Experienced operator on drainage, stripping, highway and levee construction. Machines from 1 to 8 cubic yard. Last five years on gas machines. Can do own repair work. Best references. Single. Present location Louisiana. Box 5601

DRAGLINE-SHOVEL OPERATOR

10 years' experience on Bucyrus-Erie, Link Belt, Marion and Northwest machines, steam, gasoline and Diesel powered. Have worked on highway and railroad grading, quarry excavation and drainage irrigation. Willing to go anywhere in U. S. A. Also have 2 years' machine shop experience. Can do own repairing and furnish A-1 references. Present location Florida. Box 5702.

OPERATOR

Ten years experience as shovel, clamshell, backdigger and dragline operator on Osgood, Thew, Bucyrus-Erie, Northwest and Bay City machines. A-1 references. Present location New York State. Box 5902

SHOVEL OPERATOR

5 years experience on Lorain, Northwest, Osgood, and Bucyrus-Erie Gas, Diesel and steam machines. Can do own repair work. Single and willing to go anywhere in U. S. A. or Foreign countries. Can furnish excellent references. Box 5904

OPERATOR

With 26 years experience on Monighan, Bucyrus-Erie and other makes on all kinds of projects. Can do own repair work and furnish good references. Willing to go anywhere. Present location Illinois. Box 5905.

SHOVEL CRANE AND DRAGLINE OPERATOR

15 years' experience on gasoline, G+A, Steam and Electric machines. Bucyrus-Erie, Thew and Northwest machines. Prefer operating Bucyrus-Erie. Have worked on highway and railroad grading, quarry excavation. Willing to go anywhere in U. S. A. Can do all repairing and furnish excellent references. Box 5402.

SUB-CONTRACTORS WANTED

New England contractor has several months government work and in addition to his own equipment considers renting six or more gasoline driven draglines, 40′ to 60′ booms and buckets of 1 to 2 cubic yards capacity. Gasoline for dragline will be supplied by government. All other expense paid by owner of machine. Must be ready to ship machine on 48 hours notice. Box 6001

SHOVEL OPERATOR

Ten years' experience on Steam, Gas+Air and Electric Shovels on road and quarry work. Can do own repairing and furnish excellent references. Married. Present location Virginia. Box 6100.

STRIPPING CONTRACTOR WANTED

By owner of 120 acres of good coal near Canton, Illinois. 18 to 40 feet overburden, 5½ foot vein of coal. Now opened with box cut of 500 feet. 3 and 7 miles to shipping point over gravel road. Can sell all coal; can get out at good price. Would make attractive offer on shares to owner of stripping shovel. Box 6000

EXPERT DRAGLINE AND SHOVEL OPERATOR

16 years' experience as shovel operator. Married, 36 years of age. Have operated practically all makes of machines, and have 10 years' experience as dragline operator. Can handle steam, Diesel, electric or gasoline machine. Have worked on highway and railroad grading, rock excavation in quarry, drainage and irrigation and dredging and also gold dredging. Prefer position on Bucyrus-Erie E-2, D-2, or 50-B or other Bucyrus-Erie machines. Have also operated Class 220 and 225 electric and Diesel electric machines. Capable of taking charge of repairing and erecting and can handle crews. Best of references and can do own repairing. At present located in California, but will go anywhere. Box 5507.

indebted for the material used in preparation of this article, deserves credit for carrying through the Lenhartsville job on schedule, in spite of so many days lost on account of weather. He didn't think the job made much of a story. It was just another completed contract, he apologized. Many a contractor will agree with Brenner as he said: "You know, winter grading is mostly just mud and headaches."

Book Reviews

Analysis of rigid frame concrete bridges is the title of a new 32-page illustrated booklet published by the **Portland Cement Association**, 33 West Grand Avenue, Chicago, Illinois. Data from numerous sources have been collected, co-ordinated and presented in this booklet. It contains a detailed analysis of a rigid frame concrete bridge. It also gives a new and simple method of determining stresses in double reinforced concrete sections subject to combined bending and axial thrust. The subject of skew frames is discussed. Charts of coefficients for design and a bibliography are also included.

An illustrated 16-page catalog printed in two colors has recently been published on Caterpillar gasoline power units by the **Caterpillar Tractor Company**, Peoria, Illinois. This bulletin is illustrated with operating views and close-ups of the various models as well as diagrams and horsepower torque and fuel consumption curves. Copy will be gladly sent to any reader interested by writing direct to the above manufacturer.

The Story of Hoover Dam, Volume Three has recently been published by **Ingersoll-Rand Company**, 11 Broadway, New York, N. Y. It contains 48-pages and cover and is profusely illustrated. In it are described the railroad system, the gravel treating and concrete mixing plants, and the lining of the diversion tunnels with concrete. It also contains a general account of the Colorado River aqueduct. For information regarding this booklet write Ingersoll-Rand Company, mentioning this magazine.

A new illustrated bulletin on the new **"No Pinch" Wedge Socket** has been published by **John A. Roebling's Sons Company**, Trenton, N. J. This new rope socket, characterized by the manufacturer as "highly efficient," is a recent design to protect the rope against abuse. Copy of this new bulletin will be sent to any reader upon request.

SAFE SIMPLE SAVING

Bulldog Closed Wedge Rope Socket

Bulldog Wedge Rope Sockets never fail. Unskilled labor, in practically no time at all, can apply one of these sockets. They are the safest, quickest and most convenient way of attaching wire rope.

Bulldog Open Wedge Rope Socket

They *never* let go

Designed so that the rope always pulls *directly* in line with the point of attachment. Does not kink or wear the rope where it leaves the socket.

BUCYRUS ERIE

BUCYRUS-ERIE COMPANY

Specialty Department

South Milwaukee Wisconsin

FOR SALE

RATES:	First insertion rate per column inch	Repeat insertions (no change in copy) rate per column inch
Up to 3 inches	$4.50	$4.00
Over 3 and up to 7 inches	4.25	3.75
Over 7 inches	4.00	3.50

Rates are net (no commissions, no discounts) and payable in advance of publication. Send your remittance with insertion order and copy.

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Small Shovels
Under 2 Yards

BUCYRUS ERIE So. Milwaukee, Wis.

OFFERS FOR SALE OR RENT

FACTORY REBUILT and USED SHOVELS--CRANES--DRAGLINES

Please send me full details on:

☐ Osgood 1½ yd. Steam Shovel — Bargain.
☐ Bucyrus-Erie 1030 —Gas ¾ yard shovel. Rebuilt.
☐ P & H 600 1-yd. Shovel-Dragline.
☐ Bucyrus-Erie 41-B steam 1¼-yd. Shovel. Good condition. Very low price.
☐ Osgood "Conqueror"—Gas Shovel.
☐ Monighan Dragline 60-foot boom. Priced right.

Name.....

Address.....

P. & H. MODEL 206 Gasoline Combination Shovel and Clamshell machine. Good condition. Located vicinity Chicago. Box 336-SS.

20-B BUCYRUS-ERIE STEAM SHOVEL, serial number 4000; caterpillar mounted; 18-foot boom, 12-foot 6-inch dipper handle, 1-yard dipper; shipped new in 1923; located western Missouri. Bargain. Box 241-SS.

THEW "O" ¾-cubic-yard gas shovel rebuilt 1931 and mounted on new center drive "cat". Box 343-SS.

Marion Type 32 Steam Shovel, Shop No. 5676, 18' boom, 15' dipper handle, 1¼ cu. yd. dipper, shipped May, 1926, good operating condition. Box 451SS.

CHEAP!

Two 20-B Bucyrus steam shovels. Located Aurora, Illinois. Price each $1500.

30-B Bucyrus steam shovel. Located Charleston, Mississippi. Price $1500. Box 303-SS.

MARION MODEL 32, shop No. 5459, mounted on "cats," steam-powered, 1¼-cubic-yard dipper, 24-foot boom, 17-foot 6-inch dipper handles. Box 82-SS.

BUCYRUS-ERIE TYPE "GA-2" GAS+AIR SHOVEL, shop number 4117, mounted on spur gear drive caterpillar trucks, and equipped with a 24-foot boom; 18-foot, 4-inch dipper handle; 1-cubic-yard manganese cast front socket inserted tooth dipper; power boom hoist; air self-starter, and all equipment and appurtenances in accordance with the specifications of Bucyrus-Erie Company, f.o.b. cars shipping point Virginia. Box 126-SS.

ONE TYPE "B" BUCYRUS-ERIE STEAM MACHINE, mounted on "cats", ¾-cubic-yard dipper, shop number 2301, 19-foot boom and 16-foot dipper handle. Box 83-SS.

BRAND NEW PAGE DRAG SHOVEL EQUIPMENT suitable for application to Bucyrus-Erie 1030, 1035, or 32-B machines now in the field, consisting of 17-foot 1½-inch boom, 11-foot dipper handle, and two ¾ cubic-yard dippers; one 38-inches wide over cutters—the other 49½-inches wide over cutters, together with auxiliary A frame and ropes. Priced below cost. Box 381-SS.

USED P&H MODEL 700 gasoline, combination shovel-dragline, shop number 3007, including 1¼-cubic-yard drag scraper bucket. Dragline boom 40-foot plus 10-foot extension, shovel boom 25-foot 10-inches, dipper handle 19-foot 3-inches, dipper 1¼-cubic-yard. Engine Waukesha Type WL 4 cylinder 6¼"x7". Good condition. Some repair parts on hand. Machine located Tilleda, Wisconsin. Box 378-SS.

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Small Shovels
Under 2 Yards
Continued

BUCYRUS-ERIE SLIGHTLY USED ½-CUBIC YARD Rope crowd gasoline shovel. Will demonstrate. Box 282-SS.

REBUILT GA-2 BUCYRUS-ERIE SHOVEL mounted on single shaft caterpillar, 1¼-cubic yard inserted tooth dipper, 22-foot 6-inch boom, 16-foot dipper handle, starter. Carries guarantee of new machine. Box 43-SS.

BUCYRUS-ERIE 20-B steam shovel ¾-yard Dipper, $850. Chicago territory. Box 348-SS.

FOUR TYPE B BUCYRUS-ERIE STEAM SHOVELS. Good operating condition. $1000 each. Box 328-SS.

ONE 18-B BUCYRUS-ERIE, ⅞-yard dipper on full revolving caterpillars. Box 182-SS.

OSGOOD "CONQUEROR" GAS SHOVEL. Brand New. LeRoi 6-cyl. Engine. Excellent condition. Box 412-SS.

NORTHWEST SHOVEL, model 105, caterpillar mounted, 24-foot boom, 1-cubic-yard dipper, 16-foot dipper handle. In good condition. Price $4,500, f. o. b. Utica, New York. Box 84-SS.

P&H MODEL 204. Shop number above 2200 combination Shovel Clamshell. 19' shovel boom, 14' 6" dipper handles, ½ cubic yard dipper. 35' clamshell boom, ½ cubic yard Owens Type M digger type bucket. Both front end equipments less than one year old. Excellent condition. Box 284-SS.

BYERS BEARCAT, Model 27, gasoline ½-cubic-yard Skimmer scoop, crane-clamshell and drag shovel with front opening dipper. Engine—4-cylinder, 4"x5" Hercules Model OX. Machine new July 1928. Excellent condition. Box 293-SS.

TYPE B BUCYRUS-ERIE COMBINATION HIGH LIFT STEAM SHOVEL, 19-foot 8-inch boom, 16-foot dipper handle, ¾-cubic yard dipper, power boom hoist and 36-foot boom clamshell equipment complete. Located central Indiana. Price as is, f.o.b. present location $2,000. Box 311-SS.

BROWNING STEAM LOCOMOTIVE CRANE, 20 ton capacity, 50 foot boom.

BUCYRUS-ERIE GAS + AIR CRANE with 40-foot boom, ¾-yard Page Dragline bucket. Fairleads and shovel boom, no dipper stick. Machine No. 4347.

Box 373-SS.

BUCYRUS-ERIE 1030, ¾-cubic-yard rope crowd gasoline shovel. Factory rebuilt and guaranteed. Box 283-SS.

TYPE B-2 BUCYRUS-ERIE STEAM SHOVEL, number 9830, mounted on single shaft caterpillar type mounting. Equipped with 21-foot 3-inch boom, 16-foot dipper handle, ⅞-cubic-yard inserted tooth dipper. Boom hoist and Mass. standard boiler. Located vicinity of Boston. Reasonably priced. Box 345-SS.

BUCYRUS-ERIE GAS + AIR Combination high lift shovel and dragline equipment. Chain drive. "Cats." Very good condition. Located vicinity Chicago. Box 337-SS.

BUCYRUS-ERIE MODEL 32-B Gas Chain Crowd Shovel—21' 6" Boom, 16' Dipper Handle, ⅞ yard Cast Front Inserted Tooth Dipper, Wisconsin six-cylinder 5"x6" Engine. Excellent condition. Box 422SS.

BUCYRUS-ERIE TYPE B High Lift Steam Shovel, Power Boom Hoist. Good condition. Box 425SS.

BUCYRUS-ERIE GA-2 High Lift Shovel—22'6" Boom, 16' Dipper Handle, 1¼ cubic yard Dipper, four cylinder 6¼"x8" Engine, Single Shaft Cat. Shop reconditioned. Bargain price. Box 426SS.

BUCYRUS-ERIE D-2 Diesel High Lift Shovel—26' Boom, 17' Dipper Handle, 1 cubic yard Dipper, Atlas four cylinder 6½"x8½" Engine. Excellent condition. Box 428SS.

AMERICAN Gas Shovel—21' Boom, 15' Dipper Handle, 1 cubic yard Dipper, Waukesha four cylinder 6"x7" Engine. Bargain price. Box 429SS.

BAY CITY Chain Crowd Gas Shovel—15' Boom, 11' Dipper Handle, ⅜ cubic yard Dipper. Also 25' Boom Clamshell Equipment and ⅜ yard Clamshell Bucket. Excellent operating condition. Bargain price. Box 430SS.

BYERS BEARCAT Gas Shovel—16' Boom, 12' Dipper Handle, ¾ yard Dipper, Hercules Gas Engine. Also 30' Boom Dragline Equipment. Good mechanical condition. Price right. Box 431SS.

P&H MODEL 208—45' Boom Dragline—100 HP Waukesha Gas High Altitude Engine. Good operating condition. Box 432SS.

P&H MODEL 207—40' Boom Dragline—Ruda Gas Engine. Field reconditioned. Box 433SS.

P&H MODEL 600 Gas Shovel—20' Boom, 14'3" Dipper Handle, 1 cubic yard Dipper. Also 40' Boom Clamshell and Dragline Equipment available. 75 HP Waukesha Gas Engine. Bargain price. Box 434SS.

KOEHRING MODEL 1 Gas 30' Boom Crane—4½"x5" Wisconsin Engine. Box 435SS.

OSGOOD Steam Shovel—21'9" Boom, 16' Dipper Handle, 1½ cubic yard Dipper. Good operating condition. Box 436SS.

BUCYRUS-ERIE GA-2 SHOVEL—22'6" Boom, 16' Dipper Handle, 1¼ cubic yard Dipper, Waukesha four cylinder 6¼"x8" Engine—Brand New cylinders. Factory rebuilt. New Machine Guarantee. Box 439SS.

LORAIN 75-B Shop No. approximately 5000—21' Boom, 18' Dipper Handle, 1¼ cubic yard all cast Dipper, automatic Dipper Trip, Standard center drive Cat, Power Boom Hoist, four cylinder Waukesha 6¼"x8" Gas Engine. New July, 1930. Located Strawn, Texas. Excellent mechanical condition. Box 441SS.

HIGH LIFT TYPE B-2 steam shovel No. 3867 mounted on caterpillars and equipped with 19'9" boom, 16' dipper handle, ⅞ cu. yd. inserted tooth dipper, two speed, heavy counterweight, and boom hoist. Located in New York State (at or near Pine Bush). Would accept any reasonable offer. Box 448 SS.

TYPE GA-2 SHOVEL NO. 10937 mounted on single shaft caterpillar mounting and equipped with 24' boom, 16' dipper handle, 1¼ cu. yd. inserted tooth dipper, electric starter and boom hoist. Located in Massachusetts—now working. Can be purchased at very low price. Box 445 SS.

TYPE GA-2 SHOVEL NO. 9774 mounted on caterpillars and equipped with 24' boom, 18'4" dipper handle, 1 cu. yd. inserted tooth dipper, and air starter. Located in Massachusetts—now working. Can be purchased at very low price. Box 446 SS.

INDUSTRIAL BROWN-HOIST MODEL "H"—50' Boom, Steam 8 Wheel Locomotive Crane—50,000 lb. capacity. Good operating condition. Located vicinity Chicago. Box 442SS.

BUCYRUS-ERIE TYPE B-2 High Lift Steam Shovel and 40' Boom Clamshell Equipment. Single Shaft Cat. Good operating condition. Box 420SS.

BUCYRUS-ERIE 37-B GAS SHOVEL—1½-cu. yd. dipper, 21' 6" boom, 15' dipper handle, single shaft Cat, chain crowd, Wisconsin six-cylinder gas engine, battery lighting plant. Factory rebuilt. New Machine guarantee. Box 438-SS.

P&H MODEL 600—1-yard Gasoline Shovel. Three years old. Excellent condition throughout. Just been thoroughly overhauled. Will sacrifice at bargain to responsible buyer. Located in Wisconsin. Box 363-SS.

BUCYRUS-ERIE 41-B STEAM SHOVEL—21 foot boom, 15 foot dipper handle, 1¼ cu. yd. dipper. Good operating condition. Box 406-SS

Small Draglines
Under 2 Yards

BUCYRUS-ERIE D-2—Atlas Diesel—45' boom dragline and 1 cu. yd. Page bucket. Cat mounted. Good operating condition. Located near Lake Providence, Louisiana. Very attractive price. Box 450-SD.

BUCYRUS-ERIE D-2 DIESEL—40' Boom Dragline, used on light work about 6 months since rebuilding. Excellent condition. Located Central Ohio. Box 443 SD.

MONIGHAN 60 FOOT BOOM DRAGLINE mounted on 1-W walking device—Waukesha 5¾x8, 4 cyl. gas engine, also 1¼ yd. Page bucket. Good operating condition. Box 408-SD

P & H Model 206 B Dragline. Good operating condition. Very favorably priced. Box 390-SD.

BUCYRUS-ERIE GAS+AIR combination high lift dragline and shovel. Chain drive. "Cats." Excellent condition. Located vicinity Chicago. Box 337-SD.

BUCYRUS-ERIE E-2 DIESEL DRAGLINE, caterpillar mounted, 50-foot boom, 1¼-cubic-yard Omaha bucket, Kohler lighting plant. Machine was new in July 1930 and has been used less than 6 months. Box 243-SD.

P&H MODEL 700 USED GASOLINE COMBINATION DRAGLINE-SHOVEL, shop number 3007, 40-foot dragline boom plus 10-foot extension and 1¼-cubic-yard drag scraper bucket. 25-foot 10-inch shovel boom, 19-foot 3-inch handle and 1¼-cubic-yard dipper. Waukesha Type WL 4 cylinder 6¼"x8" engine. Good condition. Some repair parts on hand. Machine located Tilleda, Wisconsin. Box 378-SD.

30-B BUCYRUS-ERIE DIESEL DRAGLINE with 40-foot boom and 1-cubic-yard bucket located in Alabama. Box 91-SD.

P & H MODEL 700 DRAGLINE: number 2894 equipped with a 50-foot boom, light 1½-cubic-yard drag bucket, electric light plant, and powered with 4-cylinder Atlas Diesel engine. Box 189-SD.

P & H DRAGLINE MODEL 700: number 2456 equipped with a 50-foot boom, light 1½-cubic-yard drag bucket, electric light plant, and powered with a Waukesha gasoline engine. Box 190-SD.

FOR SALE OR RENT

One practically new Bucyrus-Erie Model E-2 Dragline, Diesel driven, equipped with 50' boom and 1½-yard Omaha dragline bucket, now located at Shenandoah, Iowa. Box 244-SD.

P&H MODEL 600 GAS DRAGLINE. 40 foot boom. 75 H.P. Waukesha gas engine. Also available clamshell • equipment; shovel equipment with 20 foot boom, 14 foot 3 inch dipper handle and 1 cubic yard dipper. Bargain price. Box 434SD.

BUCYRUS-ERIE 30-B Diesel—40' Boom Dragline Box 437SD

BYERS BEARCAT GAS DRAGLINE with 30 foot boom. Hercules gas engine. Also shovel equipment including 16 foot boom, 12 foot dipper handle and ⅜ yard dipper. All in good mechanical condition. Price right. Box 431SD.

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Small Clamshells and Cranes
Under 2 Yards

TYPE B CLAMSHELL MACHINE NO. 2609 mounted on caterpillars and equipped with 40' clamshell boom and necessary equipment for clamshell operation (but not including clamshell bucket). Located in Connecticut. Would accept any reasonable offer. Box 447-SCC.

GENERAL 35-FOOT BOOM CLAMSHELL MACHINE and ½-cubic-yard Lakewood bucket. Equipped with four cyinder Budda gasoline engine. Machine new September, 1929. Box 335-SCC.

P&H MODEL 600 GASOLINE CLAMSHELL MACHINE. 40 foot boom. 75 H. P. Waukesha gas engine. Also dragline equipment and shovel equipment including 20 foot boom, 14 foot 3 inch dipper handle and 1 cubic yard dipper. Bargain price. Box 434SCC.

BAY CITY CLAMSHELL MACHINE, 25 foot boom and ⅝ yard clamshell bucket. Excellent operating condition. Bargain price. Also chain crowd shovel equipment with 15 foot boom and 11 foot dipper handle—⅜ cubic yard dipper. Box 430SCC.

P. & H. MODEL 206 combination clamshell and shovel. Located near Chicago. Good condition. Box 336-SCC.

BUCKEYE CLAMSHELL-CRANE, gasoline driven, caterpillar mounted, equipped with 30-foot boom, ⅝-cubic-yard clamshell bucket, fairleads and backfiller scraper. Located in Milwaukee, Wisconsin. Box 371-SCC.

BUCYRUS-ERIE—SLIGHTLY USED LOAD-MASTER TRACTOR CRANE 14' BOOM— Rubber tired Wheels—Rated Lifting Capacity 4500 lbs. McCormick Deering Power Unit—New machine guarantee. Box 410-SCC.

BROWNHOIST CRANE — Gas — Cats. Model 2-C. Serial No. 8829. 1-yd. bucket. Good working condition. $1000.

McMYLER MODEL J. LOCOMOTIVE CRANE—35 Ton Steam. 50 and 75-ft. Boom. 1½ or 2-yd. buckets. New boiler and swinging engine recently installed. A real crane for long reach and heavy work. Thoroughly overhauled condition. $4,500.

Box 346-SCC.

If You Do Not Find What You Want Listed—Write Us

The Excavating Engineer
South Milwaukee, Wis.

Large Shovels and Draglines
2 Yards and Over

BUCYRUS-ERIE SHOP REBUILT 100-B STEAM SHOVEL; shop number 4890; 29-foot 6-in. boom, 20-foot handle; three-cubic-yard dipper. Can be inspected at So. Milwaukee, Wis. Priced to sell. Box 187-LSD.

50-B STEAM SHOVEL, Number 3946; equipped with 1½-cubic-yard dipper, 26-foot boom, also 1½-cubic-yard dragline bucket with 50-foot boom caterpillar mounted, equipped for burning oil, located at Texarkana, Ark. Price very reasonable. Box 112-LSD.

For Sale or Rent

ONE CLASS-14 STEAM DRAGLINE excavator. Number 3402, 70-foot boom, 2-cubic-yard bucket, caterpillar mounted, equipped for burning gas or oil. Priced very reasonable. Located at Grand Prairie, Texas. Box 110-LSD.

68-C BUCYRUS ELECTRICALLY OPERATED SHOVEL, equipped with 2½-yard manganese front dipper, 3 phase, 60-cycle, 440-volt motors, transformers, cable reel and approximately 1400 feet of cable, all in excellent condition. Reasonable price.
Address Box 268-LSD.

6-YD. SHOVEL

BUCYRUS-ERIE 320-B electric shovel, Ward-Leonard control, 3 phase, 60 cycle, 2300 volts, equipped with 6-cubic-yard dipper, 85-foot boom and 58-foot handles. In good condition and may be inspected in operation. Reasonably priced. Box 279-LSD.

What Do You Bid On a

70-C STEAM SHOVEL located near Marietta, South Carolina, where it completed a railroad job? Bargain as supplementary shovel or as supply of spare parts.

88-C STEAM SHOVEL located in Kansas. Carefully laid up after completing season's work. 3½-yard dipper. Fine condition. Any reasonable offer accepted.
Box 52-LSD.

FOR SALE

CLASS 14 STEAM DRAGLINE with 2-yard Page bucket. Location Iowa. Very good condition. Surprisingly low price f.o.b. cars.

ALSO

2-YARD MONIGHAN STEAM DRAGLINE in fair condition—cheap.
Box 419LSD

70-TON STEAM SHOVEL mounted on "cats," caterpillars in good condition. Located near Hazelton, Pa. Box 162-LSD.

50-B STEAM SHOVEL, new March 1927. Shop number about 4950. Has 26-foot boom, 17-foot dipper handle and 2-cubic-yard dipper. Priced to sell. Box 240-LSD.

225-B OWNERS

You may be interested in a partial Bucyrus-Erie 225-B steam shovel located in Kentucky coal fields as a source of spare parts. No reasonable offer refused. Box 211-LSD.

MONIGHAN DRAGLINE MODEL T, 2-cubic-yard 60-foot boom located near Wichita, Kansas, where it is now working. About seven years old. Has recently been thoroughly overhauled. Box 180-LSD.

DIESEL-ELECTRIC DRAGLINE

Class 14 Diesel electric dragline, Shop Number 5079, new fall of 1927 with 70-foot boom, 2-cubic-yard bucket, and with extra 10-foot extension, western location.
Box 296-LSD.

50-B BUCYRUS-ERIE ELECTRIC SHOVEL, equipped with 3-phase A. C. current, 550 volts, 60 cycle and has three motors. New Manganese steel dipper. Located South Carolina. Box 226-LSD.

85-C STEAM SHOVEL, on caterpillar mounting, caterpillars in good condition, price $2,500. Located near Hazelton, Pa. Box 163-LSD.

For Sale or Rent

ONE CLASS-14 STEAM DRAGLINE excavator Number 3327 60-foot boom, 2-cubic-yard bucket, caterpillar mounted, equipped for burning gas or oil. Price very reasonable. Located at Turkey Creek, La. Box 111-LSD.

If You Do Not Find What You Want Listed—Write Us

Excavating Engineer
South Milwaukee, Wisconsin

70-C BUCYRUS STEAM SHOVEL on Cats. Complete. In operating condition. Shop number 1712. Also one extra three-yard Manganese dipper. $2,000. Chicago territory.
Box 347-LSD.

175-B STEAM SHOVEL No. 4090, equipped with 75-foot boom, 48-foot dipper handle and 3½-cubic-yard dipper. Machine is in very good condition. Oversize boiler. Box 148-LSD.

3-YD. SHOVEL

BUCYRUS 78-C, caterpillar mounted; three-cubic-yard dipper; shop number 3611. Boom rebuilt last year. Equipped with new 103-C boiler and will pass boiler inspection in any state. Shovel is in very good condition and is in operation at present time.
Box 326-LSD.

BUCYRUS 320-B STEAM STRIPPING SHOVEL, shop number 4205, new in 1925, used less than four years. Located at Toronto, Ohio. Box 74-LSD.

TYPE 175-B ELECTRIC, No. 794 equipped with 87' shovel boom, 48' dipper handle, 3½-yd. bucket, and dragline equipment including 125' boom, and 3½-yd. bucket. This machine was recently reconditioned and is in good operating condition. Present location, Connecticut. Box 263-LSD.

BUCYRUS 70-C, Shop number around 1500. Thoroughly overhauled. Good working condition. Eastern location. Box 299-LSD.

CLASS-24 BUCYRUS-ERIE STEAM DRAGLINE, shop number 912; 115-foot boom, 3½-cubic-yard Page bucket. Florida location.
Box 73-LSD.

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Miscellaneous Equipment

TWO BARBER-GREENE LOADING MACHINES. Priced extremely low for quick sale. Box 415-ME.

4 LA PLANT CHOATE 6-yard, all-steel, dump wagons. Equipped with wide iron wheels. Price $200.00 each. Chicago territory. Box 349-ME.

For Sale or Rent

Two 40-ton, 6-wheel switchers. Recently overhauled and rebuilt. Two 50-ton, 6-wheel switchers. In excellent condition. Location Chicago. Box 306-ME.

LOCOMOTIVES

8 BALDWIN, 17x24, straight drive standard gauge 45 ton locomotives. 54 inch boilers. Shop numbers from 32,750 to 34,611. Each one has passed State Boiler Inspection yearly. Boilers will stand cold water test of 240 lbs. At present in actual service in Minnesota mine.

2 BALDWIN Locomotives, 19x26, standard gauge, 6 wheel switching type, shop numbers 39534 and 39536. Box 152-ME.

COMPLETE EQUIPMENT for 2 strip mines, contractors or quarry operations, No. 300 and No. 36 Marion steam shovels, well drills, locomotives, cars, crushers, picking tables, loading booms, cable and button retarders, compressors, motors, transformers, flood and search lights, camp equipment and new repair parts for above. Box 195-ME.

COMPLETE CONTRACTORS EQUIPMENT

Offered for sale by Southern contractors. Priced to sell.

7—Railroad Type Steam Shovels 2½ to 5 yd.
3—Full Revolving Shovels ¾ yd.
1—Gasoline Clamshell Crane ½yd.
2—Jordan Spreaders.
2—Locomotives, 26 Ton, American Saddle Tank.
32—12-yd. Western Heavy Duty Dump Cars
3—Camp Cars
1—Flat Car
2—1-Bag Gasoline Concrete Mixers
Pumps, Boilers, Jacks and Other Tools

For further particulars, Address Box 138-ME.

November Advertisers

American Steel and Wire Company	437
Bargain Counter	473-478-479
Blaw-Knox Company	469
Bucyrus-Armstrong	438
Bucyrus-Erie Company	2nd and 4th covers
Bucyrus-Erie Company, Specialty Dept.	481
Bucyrus-Monighan Company	471
Dietz Company, R. E.	469
For Sale Advertisements	481 to 484
(See also pages 473-478-479)	
Harnischfeger Corporation	469
Hayward Company, The	473
Hercules Powder Company	439
Ingersoll-Rand Company	441
Koenig Labor Agencies	477
Leschen & Sons Rope Company, A.	465
Linn Manufacturing Corporation	440
Loadmaster	467
Loomis Machine Company, The	473
Miley Company, Inc., L. J.	477
Nordberg Manufacturing Company	475
Positions Wanted Advertisements	480
Roebling's Sons Company, John A.	3rd cover
Sauerman Bros., Inc.	475
Wellman Engineering Company, The	477
Western Wheeled Scraper Company	463

To facilitate *your* making inquiry directly to advertisers regarding catalogs, prices, etc., we provide in the center of this magazine two postal cards which you may address and mail with minimum time and expense involved.

For inquiry on supplies and equipment not advertised another postal card addressed to us is provided. Check plainly *only* those items in which you are interested. *Excavating Engineer* will be pleased to serve you in forwarding your inquiry to manufacturers.

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN, U. S. A.
Works: South Milwaukee, Wis., Erie, Pa., Evansville, Ind.

FOREIGN DISTRIBUTORS

ARGENTINE REPUBLIC: General Electric S. A., Buenos Aires, Rosario de Santa Fe, Tucuman, Cordoba, Mendoza.
BOLIVIA: International Machinery Co., Casilla, 254, Oruro.
BRAZIL: International Machinery Company, Recife, Rio de Janeiro, Sao Paulo.
CHILE: International Machinery Company, Santiago, Antofagasta, Nitrate Agencies, Ltd., Iquique.
CHINA (exclusive of Manchuria) AND HONGKONG: Messrs. Arnhold & Co., Ltd., Shanghai.
COLOMBIA: International General Electric S. A., Barranquilla, Bogota, Medellin, and Cali; New York.
HAITI, REPUBLIC OF: Anton Kneer, Port au Prince.
HAWAII: Theo. H. Davies & Co., Ltd., Honolulu.
HONDURAS AND BRITISH HONDURAS: Mullen Tractor and Equipment Co., Inc., San Pedro Sula, Belize.
JAPAN: Mitsui & Co., Ltd., New York, Tokio and principal cities of Japan.
MEXICO: Engineering Equipment Co., S. A. San Juan de Letran 24, Mexico, D. F.
PERU: International Machinery Co., Lima.
PHILIPPINE ISLANDS: Manila Machinery & Supply Co., Inc., Manila.
URUGUAY: General Electric, S. A. Montevideo.
VENEZUELA: International General Electric, S. A. Caracas, Maracaibo

Ruston-Bucyrus Limited

Headquarters and Works: LINCOLN, ENGLAND.
London Office, Imperial House, 15, 17, 19 Kingsway W. C. 2.

BRITISH ISLES

J. A. Cook, 10, Zetland Road, Bristol, England.
Ruston & Hornsby, Limited, Glasgow, Scotland.
Ruston & Hornsby Limited, Dublin, Ireland.

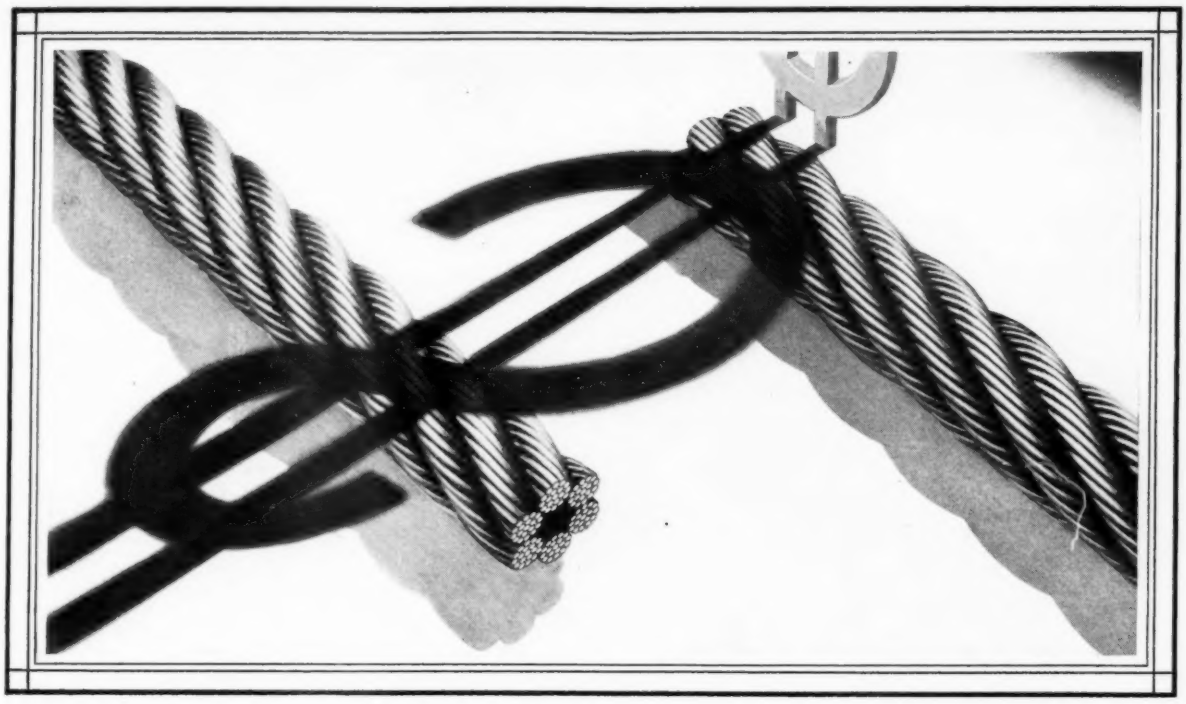
AUSTRALIA: Ruston & Hornsby Pty., Ltd., Melbourne, Sidney and Brisbane.
AUSTRIA: "Garbe" Aktiengesellschaft fur Landwirtschaftliche Maschinen und Kraftfahrzeuge, Dresdnerstrasse, 27 Vienna.
BELGIUM: Messrs. Bergerat-Dutry, 47 Rue Royale, Brussels
BURMA: William Jacks & Company, P. O. Box No. 83, 517 Merchant Street, Rangoon, Burma, India.
CZECHOSLAVKIA: Felix Pick, Stepanska 28, Prague.
DENMARK: E. T. Grew, Raadmandsgade 43, Copenhagen.
DUTCH EAST INDIES: Lindeteves Stokvis, J. W. Brouwersplein 20, Amsterdam, Holland.
FEDERATED MALAY STATES: Harper-Gilfillan & Co., Ltd., P. O. 247, Kuala Lumpur, Selenger.
FINLAND: Aktiebolaget Ekstroms, Maskinaffa Oy, Helsingfors, Finland.
FRANCE: Messrs. Brunner & Marchand, 3, Rue de Stockholm, Paris 1Xe.
GREECE: Societe Financiere et Technique de Grece, S. A., Rue Pesmatzoglou 1, Athens.
HOLLAND: Messrs. Wymalen & Hausmann, Postbus, 1216 Rotterdam.
HUNGARY: Internationale Maschinenhandels Aktiengesellschaft, Budapest.
INDIA (Eastern): McLeod & Co., Calcutta.
INDIA (WESTERN) Messrs. Greaves Cotton & Co., Ltd., P. O. Box 91, Bombay.
ITALY: Soc. An. Ing. F. Fiorentini & C., Via Tiburtina N. 384 Casella Postale 1159, Roma (39).
KENYA, UGANDA AND TANGANYIKA: Messrs. Galley & Roberts, Limited, Nairobi, Kenya Colony, British East Africa.
LATVIA: Argonaute—J. Bregeneff—Moller & E. Meyer, Miesnieku Iela No. 1 Riga.
NEW ZEALAND: John Burns & Company, Ltd., Customs Street, East, Auckland.
NORWAY: Meakin A/S Pay & Brinck, Oslo.
POLAND: Eugene Bojemski, No. 1 Podgorna, Hnd, Kotowice, Upper Silesia.
PORTUGAL: Monteiro Gomes, Limitada Rua Caracas, 47, Alcantara, Lisbon.
PUERTO RICO: West India Machinery & Supply Co., 23 Commercio St., San Juan, Puerto Rico.
SIAM: Bangkok Dock Co., Bangkok.
SPAIN: Messrs. Gumersindo Garcia, La Calle de Peligros 20, Apartado No. 731 Madrid.
STRAITS SETTLEMENTS, SARAWAK AND BRITISH NORTH BORNEO: Messrs. The United Engineers Ltd., Singapore and 87 Bishop Street, Penang.
SUDAN: Sudan Mercantile Company, Limited, P. O. Box 97, Khartoum.
SWEDEN: A. B. Tornborg & Lundbergha, Effte., Norra Bantorget 22, Stockholm, Sweden.
SWITZERLAND: Messrs. Fritz Marti, S. A., 83-85 Murtenstrasse, Bern.
TURKEY: Salt Arif and Salt Omer, Galata, Agopyan Han No. 18/19, Istanbul.
UNION OF SOUTH AFRICA: Hubert Davies & Co., Ltd., P. O. Box 1386, Johannesburg, Transvaal.
VIRGIN ISLANDS: West India Machinery & Supply Co., 23 Commercio St., San Juan, Puerto Rico.
YUGOSLAVIA: Messrs. H. & Ch. Voegeli, Knez Mihajlov Venac 1, Belgrade.

Local distributors in principal countries on the following continents: Europe, Africa, Asia (except Japan and China) Australasia and New Zealand.

Bucyrus-Monighan Co.

Works: Chicago, Ill.

Products sold exclusively by Bucyrus-Erie Company, Ruston-Bucyrus Limited and their distributors.



About the *Dollar* SIDE of Wire Rope service

WHEN you buy wire rope you want a rope which will give you *safe* service. You also want a rope which, consistent with this safety, will insure you the *lowest* possible rope cost per ton of material handled, or per other unit of work.

On this exacting basis, the use of Roebling Wire Rope will assure you of a maximum return in service for your rope dollar.

There are two principal reasons for this. First, because there is a Roebling Rope *exactly* suited to each wire rope need (see *"Wire Rope for all purposes"* at right). Secondly, because of the great stamina of Roebling Acid Steel Rope Wire.

We can confidently assert that when gauged by the work performed NO wire rope, regardless of make or construction, will show lower general-average operating costs than Roebling.

JOHN A. ROEBLING'S SONS COMPANY, TRENTON, N. J.

Wire · Wire Rope · Copper & Insulated Wires & Cables · Welding Wire · Flat Wire · Wire Cloth & Wire Netting

Atlanta Boston Chicago Cleveland Los Angeles New York Philadelphia
Portland, Ore. San Francisco Seattle Export Dept., New York, N. Y.

A plain statement about Wire Rope Economy

Roebling does not indulge in nor encourage sweeping claims of superior wire rope economy. Such claims, if generally made, would merely confuse the rope user. ¶ For the guidance of rope buyers, however, Roebling does assert that when gauged by the work performed, NO wire rope, regardless of make or construction, will show lower general average operating costs than Roebling.

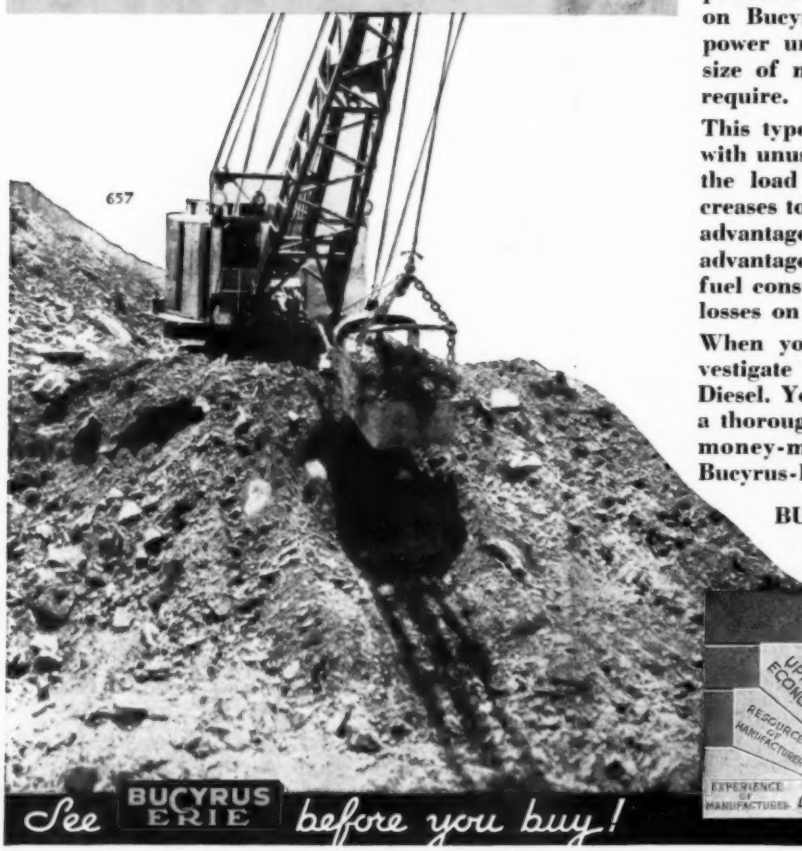
Wire Rope for all purposes

The importance of selecting the right rope for each use cannot be too strongly emphasized. For no one rope will meet all requirements. ¶ Roebling makes wire rope of a great variety of types and designs, including Standard Right, Left, Lang, Preformed and Alternate Lays, in all degrees of rope and strand flexibility. ¶ The great stamina of all Roebling Ropes is primarily due to the quality of Roebling Wire. This Acid Steel Wire is renowned for its fatigue resisting and wearing qualities. No better rope wire is produced. ¶ "BLUE CENTER" STEEL is the highest grade and is generally recommended for severe duty.

JOHN A. ROEBLING'S SONS COMPANY

For your convenience in writing to John A. Roebling's Sons Co., you will find a card bound in this issue.

Proven Diesels that increase operating efficiency

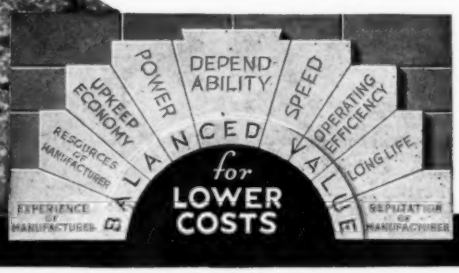


Bucyrus-Erie introduced the first Diesel shovel in 1922, and since then has built more Diesel-powered excavators than any other manufacturer — probably more than all other manufacturers combined. Remember this when you consider a Diesel powered machine; it means you can count on Bucyrus-Erie to give you the Diesel power unit that is most efficient for the size of machine and type of service you require.

This type of power gives a steady torque with unusual "lugging" characteristics. As the load increases the Diesel torque increases to the stalling point . . . of especial advantage in excavator service. Additional advantages include low cost fuel, lower fuel consumption, and elimination of fuel losses on the job.

When you select your next machine investigate the economy of a Bucyrus-Erie Diesel. You will find all the advantages of a thoroughly proven Diesel backed by the money-making, balanced-value of the Bucyrus-Erie complete line of excavators.

BUCYRUS-ERIE COMPANY
South Milwaukee, Wis.



See BUCYRUS ERIE *before you buy!*

For your convenience in writing to Bucyrus-Erie Company, you will find a card bound in this issue.